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THE
ASIATIC SOCIETY OF BOMBAY
Town Hall, Bombay.

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ASIATIC RESEARCHES;

OR,

TRANSACTIONS

OF THE

SOCIETY INSTITUTED IN BENGAL,

For inquiring into the

History and Antiquities,

THE

ARTS, SCIENCES, AND LITERATURE,

OF

ASIA.

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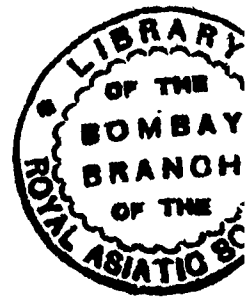

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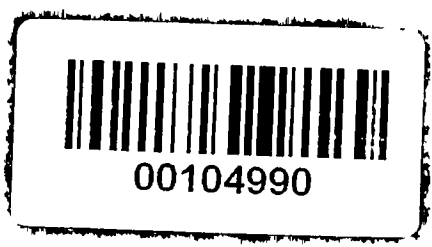
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ADVERTISEMENT.

THE unfortunate death of Sir *William Jones*, on the 27th of *April*, 1794, having deprived the Society of their Founder and President, a meeting of the Members was convened on the 1st of *May* following, when it was unanimously agreed to appoint a Committee, consisting of Sir *Robert Chambers*, Mr. Justice *Hyde*, Colonel *John Murray*, *John Briston*, and *Thomas Graham*, Esquires, to wait on Sir *John Shore*, and, in the Name of the Society, request his acceptance of the office of their President. With this request he, in terms highly flattering to the Society, agreed to comply; and on the 22d of *May*, 1794, took his seat as President, and delivered the Discourse, No. 12, of this Volume.

EDMUND MORRIS, *Secretary*.

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I.

THE TENTH

ANNIVERSARY DISCOURSE,

Delivered 28 *February*, 1793,

BY THE PRESIDENT,

ON

ASIATIC HISTORY,

CIVIL AND NATURAL.

BEFORE our entrance, Gentlemen, into the Disquisition promised at the close of my Ninth Annual Discourse, *on the particular Advantages which may be derived from our concurrent Researches in Asia*, it seems necessary to fix, with precision, the sense in which we mean to speak of *advantage* or *utility*. Now, as we have described the five Asiatic regions on their largest scale, and have expanded our conceptions in proportion to the magnitude of that wide field, we should use those words which comprehend the fruit of all our inquiries, in their most extensive acceptation; including not only the solid con-

veniences and comforts of social life, but its elegances and innocent pleasures, and even the gratification of a natural and laudable curiosity; for, though labour be clearly the lot of man in this world, yet, in the midst of his most active exertions, he cannot but feel the substantial benefit of every liberal amusement which may lull his passions to rest, and afford him a sort of repose without the pain of total inaction, and the real usefulness of every pursuit which may enlarge and diversify his ideas, without interfering with the principal objects of his civil station or economical duties; nor should we wholly exclude even the trivial and worldly sense of *utility*, which too many consider as merely synonymous with *lucre*, but should reckon among useful objects those practical, and by no means illiberal arts, which may eventually conduce both to national and to private emolument. 'With a view then to *advantages* thus explained, let us examine every point in the whole circle of arts and sciences, according to the received order of their dependence on the faculties of the mind, their mutual connexion, and the different subjects with which they are conversant: our inquiries indeed, of which Nature and Man are the primary objects, must of course be chiefly *Historical;* but since we propose to investigate the *actions* of the several

Asiatic nations, together with their respective progress in *science* and *art*, we may arrange our investigations under the same three heads to which our European analysis has ingeniously reduced all the branches of human knowledge; and my present Address to the Society shall be confined to History, civil and natural, or the observation and remembrance of *mere facts* independently of ratiocination, which belongs to philosophy; or of *imitations* and *substitutions*, which are the province of art.

Were a superior created intelligence to delineate a map of general knowledge (exclusively of that sublime and stupendous theology, which himself could only hope humbly to know by an infinite approximation) he would probably begin by tracing with Newton the system of the universe, in which he would assign the true place to our little globe; and having enumerated its various inhabitants, contents, and productions, would proceed to man in his natural station among animals, exhibiting a detail of all the knowledge attained or attainable by the human race; and thus observing perhaps the same order in which he had before described other beings in other inhabited worlds; but though Bacon seems to have had a similar reason for placing the History of Nature before that of Man, or the whole before one of its parts,

yet, consistently with our chief object already mentioned, we may properly begin with the Civil History of the Five Asiatic Nations, which necessarily comprizes their geography, or a description of the places where they have acted, and their astronomy, which may enable us to fix with some accuracy the time of their actions: we shall thence be led to the history of such other animals, of such minerals, and of such vegetables as they may be supposed to have found in their several migrations and settlements, and shall end with the uses to which they have applied, or may apply, the rich assemblage of natural substances.

I. In the first place, we cannot surely deem it an inconsiderable advantage that all our historical researches have confirmed the Mosaic accounts of the primitive world; and our testimony on that subject ought to have the greater weight, because, if the result of our observations had been totally different, we should nevertheless have published them, not indeed with equal pleasure, but with equal confidence; for *truth is mighty, and*, whatever be its consequences, *must always prevail:* but, independently of our interest in corroborating the multiplied evidences of revealed religion, we could scarce gratify our minds with a more useful speculative entertainment than the contemplation

of those wonderful revolutions in kingdoms and states, which have happened within little more than four thousand years; revolutions almost as fully demonstrative of an all-ruling Providence as the structure of the universe, and the final causes which are discernible in its whole extent, and even in its minutest parts. Figure to your imaginations a moving picture of that eventful period, or rather a succession of crowded scenes rapidly changed. Three families migrate in different courses from one region, and, in about four centuries, establish very distant governments and various modes of society: Egyptians, Indians, Goths, Phenicians, Celts, Greeks, Latians, Chinese, Peruvians, Mexicans, all sprung from the same immediate stem, appear to start nearly at one time, and occupy at length those countries, to which they have given, or from which they have derived, their names. In twelve or thirteen hundred years more, the Greeks overrun the land of their forefathers, invade India, conquer Egypt, and aim at universal dominion; but the Romans appropriate to themselves the whole empire of Greece, and carry their arms into Britain, of which they speak with haughty contempt. The Goths, in the fulness of time, break to pieces the unwieldly Colossus of Roman power, and seize on the whole of Britain, except its wild mountains;

but even those wilds become subject to other invaders of the same Gothic lineage. During all those transactions the Arabs possess both coasts of the Red Sea, subdue the old seat of their first progenitors, and extend their conquests, on one side, through Africa, into Europe itself; on another, beyond the borders of India, part of which they annex to their flourishing empire. In the same interval the Tartars, widely diffused over the rest of the globe, swarm in the north-east, whence they rush to complete the reduction of Constantine's beautiful domains, to subjugate China, to raise in these Indian realms a dynasty splendid and powerful, and to ravage, like the two other families, the devoted regions of Iran. By this time the Mexicans and Peruvians, with many races of adventurers variously intermixed, have peopled the continent and isles of America, which the Spaniards, having restored their old government in Europe, discover and in part overcome: but a colony from Britain, of which Cicero ignorantly declared that it contained nothing valuable, obtain the possession, and finally the sovereign dominion of extensive American districts; whilst other British subjects acquire a subordinate empire in the finest provinces of India, which the victorious troops of Alexander were unwilling to attack. This outline of human transactions, as

far as it includes the limits of Asia, we can only hope to fill up, to strengthen, and to colour by the help of Asiatic literature; for in history, as in law, we must not follow streams when we may investigate fountains, nor admit any secondary proof where primary evidence is attainable: I should, nevertheless, make a bad return for your indulgent attention, were I to repeat a dry list of all the Musselman histories whose works are preserved in Arabic, Persian, and Turkish, or expatiate on the histories and medals of China and Japan, which may in time be accessible to Members of our Society, and from which alone we can expect information concerning the ancient state of the Tartars; but on the history of India, which we naturally consider as the centre of our inquiries, it may not be superfluous to present you with a few particular observations.

Our knowledge of Civil Asiatic History (I always except that of the Hebrews) exhibits a short evening twilight in the venerable introduction to the first book of Moses, followed by a gloomy night, in which different watches are faintly discernible, and at length we see a dawn succeeded by a sun-rise, more or less early according to the diversity of regions. That no Hindu nation, but the Cashmirians, have left us regular histories in

their ancient language, we must ever lament; but from the Sanscrit literature, which our country has the honour of having unveiled, we may still collect some rays of historical truth, though time and a series of revolutions have obscured that light which we might reasonably have expected from so diligent and ingenious a people. The numerous Puranas and Itihasas, or poems mythological and heroic, are completely in our power; and from them we msy recover some disfigured but valuable pictures of ancient manners and governments; while the popular tales of the Hindus, in prose and in verse, contain fragments of history; and even in their dramas we may find as many real characters and events as a future age might find in our own plays, if all histories of England were, like those of India, to be irrecoverably lost. For example, A most beautiful poem by Somadeva, comprising a very long chain of instructive and agreeable stories, begins with the famed revolution at Pataliputra, by the murder of king Nanda with his eight sons, and the usurpation of Chandragupta; and the same revolution is the subject of a tragedy in Sanscrit, entitled the Coronation of Chandra, the abbreviated name of that able and adventurous usurper. From these [illegible] concealed, but now accessible compositions, we are enabled to exhibit a more

accurate sketch of old Indian history than the world has yet seen, especially with the aid of well-attested observations on the places of the colures. It is now clearly proved, that the first Purana contains an account of the deluge; between which and the Mohammedan conquests the history of genuine Hindu government must of course be comprehended: but we know from an arrangement of the seasons in the astronomical work of Parasara, that the war of the Pandavas could not have happened earlier than the close of the twelfth century before Christ; and Seleucus must, therefore, have reigned about nine centuries after that war. Now the age of Vicramaditya is given; and, if we can fix on an Indian prince contemporary with Seleucus, we shall have three given points in the line of time between Rama, or the first Indian colony, and Chandrabija, the last Hindu monarch, who reigned in Behar; so that only eight hundred or a thousand years will remain almost wholly dark; and they must have been employed in raising empires or states, in framing laws, improving languages and arts, and in observing the apparent motions of the celestial bodies. A Sanscrit history of the celebrated Vicramaditya was inspected at Benares by a Pandit, who would not have deceived me, and could not himself have been deceived;

but the owner of the book is dead, and his family dispersed; nor have my friends in that city been able, with all their exertions, to procure a copy of it. As to the Mogul conquests, with which modern Indian history begins, we have ample accounts of them in Persian, from Ali of Yezd, and the translations of Turkish books composed even by some of the conquerors, to Ghulam Husain, whom many of us personally know, and whose impartiality deserves the highest applause, though his unrewarded merit will give no encouragement to other contemporary historians, who, to use his own phrase in a letter to myself, may, like him, consider plain truth as the beauty of historical composition. From all these materials, and from these alone, a perfect history of India (if a mere compilation, however elegant, could deserve such a title) might be collected by any studious man who had a competent knowledge of Sanscrit, Persian, and Arabic; but even in the work of a writer so qualified, we could only give absolute credence to the general outline; for, while the abstract sciences are all truth, and the fine arts all fiction, we cannot but own, that, in the details of history, truth and fiction are so blended as to be scarce distinguishable.

The practical use of history, in affording particular examples of civil and military wisdom, has been greatly exaggerated; but principles of action may certainly be collected from it; and even the narrative of wars and revolutions may serve as a lesson to nations, and an admonition to sovereigns. A desire, indeed, of knowing past events, (while the future cannot be known, and a view of the present gives often more pain than delight,) seems natural to the human mind: and a happy propensity would it be, if every reader of history would open his eyes to some very important corollaries, which flow from the whole extent of it. He could not but remark the constant effect of despotism in benumbing and debasing all those faculties which distinguish men from the herd that grazes; and to that cause he would impute the decided inferiority of most Asiatic nations, ancient and modern, to those in Europe who are blest with happier governments; he would see the Arabs rising to glory, while they adhered to the free maxims of their bold ancestors, and sinking to misery from the moment when those maxims were abandoned. On the other hand, he would observe with regret, that such republican governments as tend to produce virtue and happiness, cannot in their nature be permanent, but are generally succeeded by oligar-

chies, which no good man would wish to be durable. He would then, like the king of Lydia, remember Solon, the wisest, bravest, and most accomplished of men, who asserts in four nervous lines, that "as hail and snow, which mar the "labours of husbandmen, proceed from elevated "clouds, and as the destructive thunderbolt fol-"lows the brilliant flash, thus is a free state ruin-"ed by men exalted in power and splendid in "wealth, while the people, from gross ignorance, "chuse rather to become the slaves of one tyrant, "that they may escape from the domination "of many, than to preserve themselves from ty-"ranny of any kind by their union and their vir-"tues." Since, therefore, no unmixed form of government could both deserve permanence and enjoy it, and since changes, even from the worst to the best, are always attended with much temporary mischief, he would fix on our British constitution (I mean our public law, not the actual state of things in any given period) as the best form ever established, though we can only make distant approaches to its theoretical perfection. In these Indian territories, which Providence has thrown into the arms of Britain for their protection and welfare, the religion, manners, and laws of the natives preclude even the idea of political freedom; but their histories may possibly suggest

hints for their prosperity, while our country derives essential benefit from the diligence of a placid and submissive people, who multiply with such increase, even after the ravages of famine, that in one collectorship out of twenty-four, and that by no means the largest or best cultivated (I mean Crishna-nagar) there have lately been found, by an actual enumeration, a million and three hundred thousand native inhabitants; whence it should seem, that in all India there cannot be fewer than thirty millions of black British subjects.

Let us proceed to geography, and chronology, without which history would be no certain guide, but would resemble a kindled vapour without either a settled place or a steady light. For a reason before intimated, I shall not name the various cosmographical books which are extant in Arabic and Persian, nor give an account of those which the Turks have beautifully printed in their own improved language, but shall expatiate a little on the geography and astronomy of India; having first observed generally, that all the Asiatic nations must be far better acquainted with their several countries than mere European scholars and travellers; that, consequently, we must learn their geography from their own writings:

and that, by collating many copies of the same work, we may correct blunders of transcribers in tables, names, and descriptions.

Geography, astronomy, and chronology have, in this part of Asia, shared the fate of authentic history; and, like that, have been so masked and bedecked in the fantastic robes of mythology and metaphor, that the real system of Indian philosophers and mathematicians can scarce be distinguished: an accurate knowledge of Sanscrit and a confidential intercourse with learned Brahmins, are the only means of separating truth from fable; and we may expect the most important discoveries from two of our members; concerning whom it may be safely asserted, that if our Society should have produced no other advantage than the invitation given to them for the public display of their talents, we should have a claim to the thanks of our country and of all Europe. Lieutenant Wilford has exhibited an interesting specimen of the geographical knowledge deducible from the Puranas, and will in time present you with so complete a treatise on the ancient world known to the Hindus, that the light acquired by the Greeks will appear but a glimmering in comparison of that which he will diffuse; while Mr. Davis, who has given us a distinct idea of Indian

computations and cycles, and ascertained the place of the colures at a time of great importance in history, will hereafter disclose the systems of Hindu astronomers, from Nared and Parasar to Meya, Varahamihir, and Bhascar; and will soon, I trust, lay before you a perfect delineation of all the Indian asterisms in both hemispheres, where you will perceive so strong a general resemblance to the constellations of the Greeks, as to prove that the two systems were originally one and the same, yet with such a diversity in parts, as to show incontestibly, that neither system was copied from the other; whence it will follow, that they must have had some common source.

The jurisprudence of the Hindus and Arabs being the field which I have chosen for my peculiar toil, you cannot expect that I should greatly enlarge your collection of historical knowledge; but I may be able to offer you some occasional tribute; and I cannot help mentioning a discovery which accident threw in my way, though my proofs must be reserved for an essay which I have destined for the fourth volume of your Transactions. To fix the situation of that Palybothra (for there may have been several of the name) which was visited and described by Megasthenes, had always appeared a very difficult problem; for though it

could not have been Prayaga, where no ancient metropolis ever stood, nor Canyacubja, which has no epithet at all resembling the word used by the Greeks; nor Gaur, otherwise called Lacshmanavati, which all know to be a town comparatively modern, yet we could not confidently decide that it was Pataliputra, though names and most circumstances nearly correspond, because that renowned capital extended from the confluence of the Sone and the Ganges to the scite of Patna, while Palibothra stood at the junction of the Ganges and Erannoboas, which the accurate M. D'Anville had pronounced to be the Yamuna; but this only difficulty was removed, when I found in a classical Sanscrit book, near 2000 years old, that Hiranyabahu, or golden-armed, which the Greeks changed into Erannoboas, or the river with a lovely murmur, was in fact another name for the Sona itself; though Megasthenes, from ignorance or inattention, has named them separately. This discovery led to another of greater moment; for Chandragupta, who, from a military adventurer, became, like Sandracottus, the sovereign of Upper Hindostan, actually fixed the seat of his empire at Pataliputra, where he received ambassadors from foreign princes; and was no other than that very Sandracottus who concluded a treaty with Seleucus Nicator; so that we have

solved another problem, to which we before alluded, and may in round numbers consider the twelve and three hundredth years before Christ, as two certain epochs between Rama, who conquered Silan a few centuries after the flood, and Vicramaditya, who died at Ujjayini fifty-seven years before the beginning of our era.

II. Since these discussions would lead us too far, I proceed to the History of Nature, distinguished, for our present purpose, from that of Man; and divided into that of other animals who inhabit this globe, of the mineral substances which it contains, and of the vegetables which so luxuriantly and so beautifully adorn it.

1. Could the figure, instincts, and qualities of birds, beasts, insects, reptiles, and fishes, be ascertained, either on the plan of Buffon, or on that of Linnæus, without giving pain to the objects of our examination, few studies would afford us more solid instruction, or more exquisite delight; but I never could learn by what right, nor conceive with what feelings a naturalist can occasion the misery of an innocent bird, and leave its young, perhaps, to perish in a cold nest, because it has gay plumage, and has never been accurately delineated; or deprive even a butterfly of its natural enjoyments, because it has the misfortune

to be rare or beautiful; nor shall I ever forget the couplet of Firdausi, for which Sadi, who cites it with applause, pours blessings on his departed spirit:—

> Ah! spare yon emmet, rich in hoarded grain;
> He lives with pleasure, and he dies with pain.

This may be only a confession of weakness, and it certainly is not meant as a boast of peculiar sensibility; but whatever name may be given to my opinion, it has such an effect on my conduct, that I never would suffer the Cocila, whose wild native wood-notes announce the approach of spring, to be caught in my garden, for the sake of comparing it with Buffon's description; though I have often examined the domestic and engaging Mayana, which bids us good-morrow at our windows, and expects, as its reward, little more than security: even when a fine young Manis or Pangolin was brought me, against my wish, from the mountains, I solicited his restoration to his beloved rocks, because I found it impossible to preserve him in comfort at a distance from them. There are several treatises on Animals in Arabic, and very particular accounts of them in Chinese, with elegant outlines of their external appearance; but I met with nothing valuable concerning them in Persian, except what may be gleaned from the medical dictionaries; nor have I yet seen a book

in Sanscrit that expressly treats of them. On the whole, though rare animals may be found in all Asia, yet I can only recommend an examination of them with this condition, that they be left, as much as possible, in a state of natural freedom; or made as happy as possible, if it be necessary to keep them confined.

2. The History of Minerals, to which no such objection can be made, is extremely simple and easy, if we merely consider their exterior look and configuration, and their visible texture; but the analysis of their internal properties belongs particularly to the sublime researches of Chemistry, on which we may hope to find useful disquisitions in Sanscrit, since the old Hindus unquestionably applied themselves to that enchanting study: and even from their treatises on alchemy we may possibly collect the results of actual experiment, as their ancient astrological works have preserved many valuable facts relating to the Indian sphere and the precession of the equinox. Both in Persian and Sanscrit, there are books on metals and minerals, particularly on gems, which the Hindu philosophers considered (with an exception of the diamond) as varieties of one crystalline substance, either simple or compound: but we must not expect from the chemists of Asia those beautiful examples of analysis which

have but lately been displayed in the laboratories of Europe.

3. We now come to Botany, the loveliest and most copious division in the history of nature; and all disputes on the comparative merit of systems being at length, I hope, condemned to one perpetual night of undisturbed slumber, we cannot employ our leisure more delightfully than in describing all new Asiatic plants in the Linnæan style and method, or in correcting the descriptions of those already known, but of which dry specimens only, or drawings, can have been seen by most European botanists. In this part of natural history we have an ample field yet unexplored; for, though many plants of Arabia have been made known by Garcias, Prosper Alpinus, and Forskoel; of Persia, by Garcin; of Tartary, by Gmelin and Pallas; of China and Japan, by Kœmpfer, Osbeck, and Thunberg; of India, by Rheede and Rumphius, the two Burmans, and the much lamented Kœnig, yet none of those naturalists were deeply versed in the literature of the several countries from which their vegetable treasures had been procured; and the numerous works in Sanscrit on medical substances, and chiefly on plants, have never been inspected, or never at least understood, by any European attached to the study of nature. Until the gar-

den of the India Company shall be fully stored (as it will be, no doubt, in due time) with Arabian, Persian, and Chinese plants, we may well be satisfied with examining the native flowers of our own provinces; but unless we can discover the Sanscrit names of all celebrated vegetables, we shall neither comprehend the allusions which Indian Poets perpetually make to them, nor (what is far worse) be able to find accounts of their tried virtues in the writings of Indian physicians; and (what is worst of all) we shall miss an opportunity, which never again may present itself; for the Pandits themselves have almost wholly forgotten their ancient appellations of particular plants; and, with all my pains, I have not yet ascertained more than two hundred out of twice that number, which are named in their medical or poetical compositions. It is much to be deplored, that the illustrious Van Rheede had no acquaintance with Sanscrit, which even his three Brahmins, who composed the short preface engraved in that language, appear to have understood very imperfectly, and certainly wrote with disgraceful inaccuracy. In all his twelve volumes I recollect only Bunarnava, in which the Nagari letters are tolerably right; the Hindu words in Arabian characters shamefully incorrect; and the Malabar, I am credibly informed, is as bad

as the rest. His delineations, indeed, are in general excellent; and though Linnæus himself could not extract from his written descriptions the natural character of every plant in the collection, yet we shall be able, I hope, to describe them all from the life, and to add a considerable number of new species, if not of new genera, which Reede, with all his noble exertions could never procure. Such of our learned members as profess medicine, will, no doubt, cheerfully assist in these researches, either by their own observations, when they have leisure to make any, or by communications from other observers among their acquaintance, who may reside in different parts of the country: and the mention of their art leads me to the various *uses* of natural substances, in the three kingdoms or classes to which they are generally reduced.

III. You cannot but have remarked, that almost all the sciences, as the French call them, which are distinguished by Greek names, and arranged under the head of *Philosophy*, belong for the most part to History; such as philology, chemistry, physic, anatomy, and even metaphysics, when we barely relate the phenomena of the human mind; for, in all branches of knowledge, we are only historians when we announce facts;

and philosophers only when we reason on them: the same may be confidently said of law and of medicine, the first of which belongs principally to civil, and the second chiefly to Natural History. Here, therefore, I speak of medicine as far only as it is grounded on experiment; and, without believing implicitly what Arabs, Persians, Chinese, or Hindus may have written on the virtues of medicinal subjects, we may, surely, hope to find in their writings what our own experiments may confirm or disprove, and what might never have occurred to us without such intimations.

Europeans enumerate more than two hundred and fifty mechanical arts, by which the productions of nature may be variously prepared for the convenience and ornament of life; and, though the Silpasastra reduces them to sixty-four, yet Abulfazl had been assured that the Hindus reckoned three hundred arts and sciences: now, their sciences being comparatively few, we may conclude that they anciently practised at least as many useful arts as ourselves. Several Pandits have informed me, that the treatises on art, which they call Upavedas, and believe to have been inspired, are not so entirely lost but that considerable fragments of them may be found at Benares; and they certainly possess many popular, but ancient

works on that interesting subject. The manufactures of sugar and indigo have been well known in these provinces for more than two thousand years; and we cannot entertain a doubt that their Sanscrit books on dyeing and metallurgy, contain very curious facts, which might, indeed, be discovered by accident, in a long course of years, but which we may soon bring to light, by the help of Indian literature, for the benefit of manufacturers and artists, and consequently of our nation, who are interested in their prosperity. Discoveries of the same kind might be collected from the writings of other Asiatic nations, especially of the Chinese; but, though Persian, Arabic, Turkish, and Sanscrit, are languages now so accessible, that, in order to attain a sufficient knowledge of them, little more seems required than a strong inclination to learn them, yet the supposed number and intricacy of the Chinese characters have deterred our most diligent students from attempting to find their way through so vast a labyrinth. It is certain, however, that the difficulty has been magnified beyond the truth; for the perspicuous grammar by M. Fourmont, together with a copious dictionary, which I possess, in Chinese and Latin, would enable any man who pleased, to compare the original works of Confucius;

which are easily procured, with the literal translation of them by Couplet; and having made that first step with attention, he would probably find, that he had traversed at least half of his career. But I should be led beyond the limits assigned to me on this occasion, if I were to expatiate farther on the historical division of the knowledge comprised in the literature of Asia; and I must postpone till next year my remarks on Asiatic Philosophy, and on those arts which depend on imagination; promising you with confidence, that in the course of the present year your inquiries into the civil and natural history of the eastern world, will be greatly promoted by the learned labours of many among our associates and correspondents.

ASIATIC RESEARCHES.

ON

THREE NATURAL PRODUCTIONS

OF

SUMATRA.

BY JOHN MACDONALD, ESQ.

ON THE CAMPHOR OF SUMATRA.

IN answer to some questions put to me by the President of the *Asiatic* Society respecting camphor-oil, I have the pleasure of giving the solution contained in the following short account:—Camphor-oil, one of the essential oils, is actually camphor, before the operations of nature on it have reduced it to the concrete form in which it is found in the tree. When Mr. *Marsden* composed his justly-admired History of *Sumatra*, the prevalent opinion on this subject was, that the oil and the concreted camphor were never found in the same tree. I have the authority of a gentleman, Lieutenant *Lewis*, well informed on this subject, from a residence of many years in the country producing the camphor, to differ from that generally accurate author, by saying, that he has seen a tree three quarters of a mile from the sea, near *Tappanoolly*, from which three *catties* (above

three pounds) of camphor, and at the same time, near two gallons of oil, had been procured. If a tree be old, and yield oil plentifully, the natives esteem these two circumstances sure indications of its containing a considerable quantity of camphor. Mr. *Macquer*, in his chemical dictionary, has remarked, that the nitrous acid dissolves camphor without commotion, that the solution is clear and limpid, and that it is called Camphor-Oil. This affords a proof that the formed camphor is produced from the oil by a natural operation of composition, the decomposition by means of the above solvent reducing the substance to its primary state, previous to concretion. The *Achinese* are reckoned the best judges of camphor; and the oil they collect undergoes a process by distillation, leaving a residuum of inferior camphor. Trees of a certain age only yield camphor. It would seem that a certain time is requisite for maturing the oil to that state, when its contained camphor becomes fit for being concreted by the heat of the sun acting on the tree and soil. The camphor-tree is one of the *Enneandria Monogynia* of *Linnæus*, and differs in a small variation in the form of the leaf, from the *Arbor Camphorifera Japonica, foliis laurinis, fructu parvo, calyce brevissimo.* The tree very much resembles the Bay in leaves. The trunk is thick; the bark of a brownish appearance; and the ramification strong, close, and extended. It is fond of a rich red loam, tending to a blackish clay, mixed with a crumbling stone of the colour of marl. It grows principally on the N. W. side of *Sumatra*, from the line 3° N. nearly. The wood is useful for domestic purposes, being soft and easily worked. It is by many imagined, that camphor is produced by a chemical process. This is a mistaken idea, farther than regards the inferior kind arising from the distillation of the oil. I shall give a brief account of the mode of obtaining and

preparing it, as practised by the natives of *Sumatra*, from the time of the establishment of the *English* on the island. The *Sumatrans*, previous to their setting out in quest of camphor, assemble on the confines of the country they intend exploring, and discharge a variety of religious duties and ceremonies, calculated, in their opinion, to promote the future success of their undertaking. They enter the woods, and, from experience, soon distinguish such trees as contain camphor. They pierce them; and if they yield oil plentifully, it is presumed they contain concreted camphor, which is found in small whitish flakes, situated perpendicularly, in irregular veins, in and near the centres of the trees. The tree is cut down, divided into junks, and carefully divested of its camphor. When the oil has been drawn off from young trees, the camphor which they afterwards afford, is of a less valuable nature, and is termed *belly* or *foot* camphor, in proportion to the degree of affinity it bears to *head*, or the best sort. When brought for sale, it is repeatedly soaked and washed in soapy water, to separate from it all heterogeneous and sandy particles that may have adhered to it. When clean, it will sink in water, and be of a white, glossy, smooth appearance, tending to transparency. After it has been washed, it is passed through three sieves of differing textures, so as to be divided into *head*, *belly*, and *foot* camphor: certain proportions of each compose the chests made up for the *China* market, where they are sold for 350l. sterling, nearly. The *capoor** (a word of *Arabic* origin) *matee*, or dead camphor, is carefully separated from the three divisions, by an acuteness of distinction, acquired by the eye and hand from habit and attention, and, being mixed with the imperfect

* *Cáfúr* in *Arabic*, and *Carpúra* in *Sanscrit*.

kind mentioned above, is pounded in a mortar, and distributed among proportional quantities of foot camphor. This *capoor-matee* is sometimes procured by boiling down the thickest part of the oil, or by taking the sediment of the best oil, after it has settled, at least twenty-four hours. Camphor-oil is found to be a sovereign remedy for strains, bruises, and other external pains, from its penetrating quality in entering the pores, and gently agitating the affected parts, so as to quicken the stagnated circulation. The internal, anodyne and diaphoretic, and the external, antispasmodic and sedative virtues of camphor are well known. The oil is found to possess these in a certain degree, and to be useful in removing the painful spasms of the nerves and tendons, by dissipating the surrounding acrid humours. When the oil is used, it must be formed into a liniment, as it would alone occasion pain from its strength. The oil applied to sores on horses has been found very beneficial. In this case it ought to be mixed with the juice of the tobacco. *Sumatra* affords annually from fifteen to twenty *peculs* (of 133⅓ pounds each) of camphor, and more oil than there is at present a demand for. The *Chinese* purchase it; and it is not clearly ascertained whether they use it all in *China*, or make a factitious species of it, by admixture of *Japanese* camphor, for the *Europe* market: the latter is generally supposed. It is highly probable, that the price of camphor will, in process of time, rise to an enormous degree, as one tree in three hundred is not found to contain camphor, and, when found, is immediately cut down; in consequence of which, the plant must soon become scarce, and the produce proportionably dear. It is to be hoped that the oil will, in this event, be found by the faculty to possess all the useful qualities of this valuable medicine. I have the satisfaction of accompanying this paper with a speci-

men, though a small one, of the camphor-wood, with a small quantity of the substance in it, the rest having evaporated from length of time. If this account should afford any information to the President and Members of the *Asiatic* Society, my intention will be fully answered.

ON

THE CORAL

OF

SUMATRA.

IF this paper should be deemed worthy of a place in the Transactions of the *Asiatic* Society, the insertion I must still consider as an indulgence, and my attempt, a proof that I am more anxious than able, to increase the general stock of *Eastern* natural knowledge, recorded in the useful annals of the Society. Specimens of coral, for your acceptance, and for the illustration of this subject, are now forwarded.

The appearance of *Sumatran* coral does not altogether correspond with the descriptions of the plant hitherto given*. This induces me to describe such parts as are imperfectly represented. The plant, to which the various species of coral belong, is one of the *Cryptogamiæ* of *Linnæus*, and may be reckoned one of the *Herbæ Marinæ* of *Tourneforte;* of the *Herbæ imperfectæ* of Mr. *Ray*. It may be reduced to three colours, red, black, and whitish-yellow: the last is the most common in the *Eastern* seas. It is of a fungous texture, equally hard out of and in its natural element; and its pores are charged with a juice of a milky appearance, in some degree acrid. The

* See the remark at the end of this paper.

bark covers every part of the tree, and contains a number of perforated *papillæ* terminating in tubes, having two or more holes in each, intended, I imagine, for the admission of the matter affording nutriment to the plant. The internal projections of the *papillæ* adhere to the particles of sand and stone on which the coral grows, and are the only appearance of roots it exhibits. On examining the internal extremities of these *papillæ* by means of glasses, some very small ramifications are discovered. These are very easily observed in the *papillæ*, which are attached to the bark of the root. The tree is said to grow to the height of two feet: I have seen some as high as ten feet. From these and other differences in appearance, I am apt to think that some *European* and *Indian* corals are not the same, but species of the same genus. From the very rapid growth of coral on the west coast of *Sumatra*, and in the *Eastern* seas in general, as will be shown in this paper, there can subsist but little doubt that it is a vegetable substance; though there have not been wanting some who have supposed it a fossil formed like crystals and spars; and others, eminent naturalists, who have ranked it among the animal tribes. *Boccone* discovered that this plant encloses a nutritious juice under its bark: and Count *Marsigli* remarked and observed its flowers and seeds. I shall here insert *Marsigli's* accurate experiment, which affords the decision of almost absolute demonstration in favour of coral being a vegetating plant. "Having steeped some coral, fresh-gathered, in sea-water, he perceived, in a short time, that the little ruddy tubercles which appeared on the surface of the bark, began gradually to unfold, and at length opened into white flowers in the form of stars with eight points, which were sustained by a little calyx, divided, in like manner, into eight parts. Upon taking the coral out of the water, the flowers immediately closed, and returned

into red tubercles as before; which tubercles, being closely squeezed, yielded a sort of milky juice: and upon returning the coral into the water as before, the tubercles, in an hour's time, opened, or flowered afresh; and this was continued for six or eight days, when the buds, or tubercles, ceased to blow any more. In ten or twelve days they became detached from the coral, and sunk to the bottom, in form of little yellow balls. These tubercles then, according to the analogy of plants, should be the flowers of coral; and the milky viscid juice contained therein the pollen. Accordingly it is held, that when this juice falls on a properly-disposed body or nidus, a new coral arises therefrom; and the analysis of coral answers precisely to that of other sea-plants, all of them affording a volatile urinous salt, and a thick blackish fetid oil."---Elementa Chemiæ of *Boerhaave*, page 135, Note, vol. 1. & Mem. de l'Acad. An. 1708.

Whether, after all, the striated *papillæ*, which are of a stellar figure, and the two or more apertures of which are divided, generally, into twelve parts, contain an animal whose labour produces the growth of the coral, or who inhabits the coral for its own immediate satisfaction, is a question that has been much agitated, without affording any certain conclusions. Monsieur *de Peyssonnel*, after having inquired into, and discussed, the various arguments for and against coral's being a petrification or a congelation, concludes that it is the work of an insect, which he denominates an *Urtica*, *Purpura*, or *Polype*, that contracts in air, expands in water, and is sensible to the touch, or the action of an acid. From *Marsigli's* experiment, as recited above, I think we may safely conclude, that *Peyssonnel* mistook the matter, and supposed a flower an insect; for it is well known that many flowers, on being plunged into an acid, will

exhibit signs of contraction and movement. We observe many growing substances, which are inhabited by animals, or insects, merely for their convenience, and not to promote the growth of such substances, which they very frequently, on the contrary, retard. If an animal can be supposed to produce such immense bodies of this substance, as I shall have occasion to mention, whence does it derive the prodigious degree of nutriment requisite for the purpose, as it is not found that it quits the centre of its striated habitation? why do not these *vermiculi marini* leave cells behind them, as they advance the growth of the coral? We find none, but, on the contrary, the surface uniformly smooth and even. As for the external cells, they are the channels that convey nourishment, and correspond to the fibres of plants. It must remain, however, in some degree, a doubt, whether these marine productions are zoophytes, produced by the labour of animals, or whether they are produced on a vegetating principle. It will be difficult to bring this matter to the test of modern natural philosophy, *viz.* experiment: but till such can be made, opinions must be various, though the majority, and apparently (from *Marsigli's* experiment) the best founded, incline to the belief of corals being produced by vegetation. Having slightly reviewed both sides of this curious question, and having hazarded my own opinion, which can be of little weight, I come now to the intention of troubling the *Asiatic* Society with these remarks, imperfect as they must appear.

The production of islands, on the west coast of *Sumatra*, by the very rapid increase of this wonderful plant, is a remarkable effect of the operations of nature, hitherto unrecorded in the annals of natural philosophy. Mr. *Dalrymple* alone has alleged a fact, to which this account will add the weight of

convincing testimony. In the year 1784, I was directed to survey the coast of the Dutch districts on the west side of the island of *Sumatra*. During the course of this survey, I had occasion to lay down on my charts several shoals, consisting of branched coral, sand, and such heterogeneous matter as they will resist and incorporate with themselves, when impelled against them by the action of the seas, winds, tide, or currents. The surfaces of these shoals were at various depths, from one foot to three or more fathoms. They are of a conical form, the base, in proportion to the axis, being small. The shape gives them, in general, the appearance of trees of that figure, such as the poplar, &c. One of the shoals I visited, to the south-west of *Pooloo Pinang*, near *Padang*, was at that time covered by two feet and an half of water, and could not be distinguished by vessels passing at some distance, but at such times as the winds produced a swell or agitation on it. I passed along this part of the coast in *February*, 1789, very close to this shoal, just four years and seven months after the period at which the survey had been taken; and was not a little astonished to observe a small sandy island, about ten yards in diameter, having a few bushes growing on it, formed on the top of the shoal, which lies nearly in thirty-seven fathoms of water. I could not mistake the shoal, as there was no other contiguous to it, and as my chart, by which I suggested the safest course to run in, then lay before me. In *May* and *September* 1789, I had an opportunity, in going to and returning from *Tappanoolly*-harbour (which I had been directed to survey) to be again on several of the shoals included in my chart of the coasts of the *Dutch* districts, and, according to my expectations, found the depth of the water on them considerably diminished since the survey had been taken. In March 1790, I was sent for by a gentleman at *Fort Marlborough*, whose

house commanded a view of the sea, to observe the water breaking on two shoals in the roads. This gentleman had resided on the coast near fifteen years, and frequently in this house, without having observed these shoals, which, had they appeared at any former period, must have been remarked, their situation being clearly and distinctly exposed to the daily and immediate observation of the settlement. At the distance of seven miles from *Fort Marlborough*, nearly in a south-west direction, there is a small island, having a few cocoa-nut trees in it. Thirty miles (or it may be twenty-five) distant from this island, one of the northern pepper settlements is situated on a rising ground. The gentleman residing there has informed me, that he has always been able to distinguish the masts of vessels lying at anchor near this island, and that he lately twice distinctly, in the proper bearing, observed the trees of the island: but that, afterwards, from hazy weather, or some other affection of the atmosphere, he could not perceive the island, or rather the trees on it. Former residents of *Laye*, the place of observation, have, in vain, when using the best glasses, looked for this island, invisible till lately. Such are the stubborn facts which may be adduced in proof, not only of the very rapid growth of coral, but also of the formation of islands from it, as a necessary and observed consequence. The growth of coral alone may not produce this effect: other aiding circumstances may intervene. *Beccone* and *Marsigli* have remarked, that, when coral meets with stones, coarse sand, or any other substances, it seizes them firmly, and speedily includes them within a strong extension of its close ramifications. These collections in seas, subject to frequent storms and agitations, must be considerable, and promote, in no small degree, the elevation of islands. Earthquakes are very frequently felt on this island, and on the contiguous ones. Se-

veral shocks are sometimes experienced during the course of a month. It is observable that this tremendous phenomenon, in its progress, undulates the space it moves, or travels, under; and that the concave parts of these undulations open into fissures when the motion is violent. It is not improbable but that such openings take place under shoals, or immediately contiguous to them. In this case, to preserve the equilibrium, it seems reasonable to suppose that the surrounding sand and substances will rush in, hurried along by the general movement, in a greater quantity, from the degree of momentum impelling them, than what occupied the space of the fissure when at rest. These hiatus take place only on the side of the undulation from which the earthquake proceeds; and the sand on that side, now inclining to rest, after having experienced the shock, but still possessing a tendency to move in the direction of the earthquake, will naturally fall into the hiatus opened for its reception, before the undulation can reverberate into its original position. Hence the shoal, or island, will be in some degree raised, by an effect similar to that of a lever, though by different means. These islands and shoals, being further removed than other parts exposed to the shock, from the subterraneous or submarine crannies or channels in which the earthquake acts, will, of course, resist its action more than parts possessing less incumbent weight. The undulations will, therefore, meet with more resistance, and deposit a greater quantity of sand than in situations resisting less. In the formation of islands from coral and sand, as soon as the sand appears above the surface of the water, birds carry roots and various seeds attached to them, for the construction of nests: hence the speedy appearance of bushes and trees. Instead of supposing with some, that the numerous islands on this coast have been formed by the violent commotions of nature, occasioned by

earthquakes, which separated them from the continent, it is more reasonable to suppose their formation on the above principles, and chiefly by coral; more especially, when we consider, that the depth of water between many of these islands and *Sumatra*, is unfathomable. The numerous clusters of islands in the eastern seas, from 36 to 16 degrees east longitude, are all supported by bases of coral, and surrounded by shoals emerging from the surface, or pushing their conical frusta into a new element. Experience has ascertained the formation of islands from coral: it is not altogether conjecture to suppose, that various groups of islands, in the great Eastern Archipelago, will, in process of time, become continents, or insular tracks or spaces of land. On the coast of *Coromandel*, in the immediate front of *Madras*, exposed anchorage has produced, and produces annually, lamentable accidents, attended with much public detriment. The position of a sheltering island in that situation would be an object of national benefit, and private safety and advantage. To attempt to effect this, a considerable quantity of coral might be transported from this coast, at no great expense, and sunk, with stones and other substances, in seven, eight, or eleven fathoms of water. In the course, probably, of forty or fifty years, an island might be formed by the growth of this substance. This is a long period to look forward to for the benefit of futurity; but from what I have, from my own observation, inserted in this paper, I am convinced of the practicability and success of a scheme, which many will treat as chimerical and visionary, while others, more thinking, will see the utility of the design and probability of success; but will be deterred by the difficulty and tediousness which would attend the execution.

REMARKS BY THE PRESIDENT.

It seems at length to be settled among naturalists, that corals and corallines are the cretaceous habitations of animals, and one of the links in the great chain of nature. The idea of making islands for the protection of ships at anchor, is very sublime; but it might be feared, that very dangerous reefs of coral would be formed, before an isle could appear above the water: an artificial embankment of coral might, perhaps, on some coasts, be a powerful barrier against an encroachment of the sea.

ON

THE COPPER OF SUMATRA.

I HAVE the satisfaction of laying before the *Asiatic* Society a specimen of copper-ore, the production of the island of *Sumatra*. It is found on and in the hills of *Mucchy* near the sea, between *Annalaboo* and *Soossoo*, to the north extreme of our *English* settlement of *Tappanooly*. The soil, which generates the ore is a mixed loam, consisting of clay, small stones, and red sand, founded on an under-soil of soft rock, intersected with veins of this useful substance. The space affording the ore is considerable; extending above a degree in length, and further east, or into the country, than has been yet ascertained. A considerable quantity of ore is annually collected on the surface of the hills; to which the indolence or ignorance of the inhabitants, at present, confines their search. Its being found on the surface, may probably be ascribed to the efforts of earthquakes, which are very prevalent on this coast, and over the island in general. The natives, from inexperience, are incapable of conducting a mine, and pursuing a metallic vein. They are content with excavating the ore, till their labour is interrupted by the flowing of the water, which soon takes place in a country subject to heavy rains throughout the year. As many of these veins widen as far as they have yet been traced, it is more

than probable that these hills contain inexhaustible mines of this metal. The ore, by repeated smeltings, and other operations to free it from its sulphur, has been reduced to a metal, and then found to include a considerable proportion of gold. As no part of the world contains a greater quantity of this latter metal than *Sumatra*, in proportion to the area it occupies on the globe, it is probable that the discovery of gold mines would attend the establishment of copper ones in the hills of *Annalaboo*. This is so much the more probable, as metalline stones, of various kinds, and which the *Malays* regard as sure indications of a soil affording gold, are found on these hills; independently of the consideration, that gold-dust is collected in the immediate neighbourhood, and in the interior country, contiguous to the hills yielding the copper-ore. It is singular, that the same method of rough smelting, which is practised at *Goslaw* in *Germany*, should be in use among the uncivilized inhabitants of *Sumatra*. The *Sumatran* method possesses more ingenuity, and is, at the same time, more simple. An undemonstrated knowledge of the plainest and most obvious principles of science, is congenial to the most rude as well as to the most civilized conceptions; and the advantages which the talents of *born genius* have conferred on *Europe*, are by no means a conclusive proof of the inferiority of intellect which the fortunate inhabitants of *Europe* liberally bestow on their less enlightened brethren of the *East* and *West*. That "time and chance happen unto all things under the sun," is a truth that amounts to a voluminous disquisition on this subject. But to return. The ore-gatherers chuse a level spot of hard clay, which they divide into equidistant points, by lines intersecting each other, and laid off equally on two sides of a square. These points, included in the square space, they surround with circles, of which the

points are the centres. The circles are inverted bases of cones, excavated to receive the fused metal. The smelting space is now covered with wood, charcoal, and other combustible matters; and the ore is distributed among these admixtures. The melted ore is received into the formed holes, leaving the scoriæ or recrement above. The metal, still requiring many smeltings to render it fit for use, or perfectly malleable and ductile, is taken out in the form of pointed cakes, and sold for twenty *Spanish* dollars per *pecul*, or five pounds sterling for 133⅓ pounds avoirdupois weight. The natives are particularly careful in preventing accidents; for, previously to fusing the ore, they heat the ground to a great degree, in order that all the water near the surface may be absorbed, or made to exhale; having experienced, I imagine, that copper when in a state of fusion, meeting the smallest quantity of water, will fly in all directions, with a force destructive of every vulnerable substance within the sphere of its action. I have been informed, that the metal has been eliquated at *Madras* lately, and found to contain very little appearance of any other but of gold. The usual solvents, aquafortis, aqua regia, and spirit of salts, readily dissolve the *Sumatran* copper. A deep green solution is produced in a very short time, by the action of the weaker acids on the rough ore. The above method of smelting will separate all coarse, mineral, and heterogeneous substances from the metal; but will still leave it strongly impregnated with its peculiar mineral earth. The detaching of this mineral earth is the most difficult and expensive operation attending the refinement and purification of copper; it being frequently necessary to add a proportion of another metal to effect it. This consideration will, probably, prevent a private company from applying for public permission to work these mines; and, therefore, they must remain in their

present state, unless the East India Company will order the experiment to be made, from the reports and opinions of such as may be qualified to give them, on so interesting a subject. By submitting this short account to the gentlemen of our Society, whose useful researches will, I hope, produce permanent national benefit, by advancing the knowledge of nature, of science, and of literature, opinions properly weighed will be diffused among the public, of the advantages that may result from an establishment for working copper-mines on the west coast of *Sumatra*.

ON

THE PLANT MORINDA,

AND ITS USES.

BY WILLIAM HUNTER, ESQ.

ALTHOUGH the plant, which is the subject of this essay, be not a new species, yet, as it is cultivated to a great extent in *Malava*, and forms an important branch of the commerce of that province, I hope a particular description of it, with some account of its culture and use, will not be unacceptable to the *Asiatic* Society.

It is the *Morinda* of *Linnæus:* It belongs to the order *Pentandria Monogynia* in his system, and is referred by him to the natural order of *Aggregatæ.* Here (though it may seem a digression from the subject) I cannot help observing, that *Linnæus* is not altogether consistent in the distinction, which he endeavours to establish, between the *aggregatæ* (properly so called) and the *compound* flowers. In his *Philosophia Botanica*, § 116, he defines a *compound* flower to be "that which has a broad entire receptacle, and sessile florets;" and an *aggregatæ* flower, "that which has a broad receptacle, and florets supported on peduncles." According to these definitions, the *Morinda* ought to be placed among the *compound* flowers; but in the following section,

Linnæus makes the essential character of the *compound* flowers to consist in having all the anthers united: thus restricting it to his class of *Syngenesia*. This not only excludes the *Morinda*, but ought perhaps to have, strictly speaking, excluded the *Kuhnia*, *Iva*, and *Ambrosia*; and even, allowing the approximated anthers in these genera to come within the meaning of the definition, it seems unaccountable that the *Nauclea**, which appears so well entitled to a place in one of these orders, should be excluded from both.

The *Aal* is a tree of middling size; the *root* branchy; the *trunk* columnar, erect, covered with a scabrous bark.

Branches from the upper part of the trunk, scattered; of the structure of the trunk.
Leaves (seminal) oval, obtuse, entire.
(mature) opposite, decussated, ovate, pointed at both ends, smooth, with very short petioles.
Stipules lanced very small, withering.
Peduncles, from the axils of the leaves, solitary, bearing an aggregate flower. *Calyx:* common receptacle roundish, collecting the sessile flowers into an irregular head.
Perianth most entire, scarce observable above.
Coral, one-petaled, funnel-form; *Tube* cylindric; *Border* five cleft; the *divisions* lanced.
Stamen: Filaments five, thread-form, arising from the tube, and adhering to it through two thirds of their length, a little shorter than the tube.
Anthers linear, erect.
Pistil: Germ beneath†. *Style* thread-form, longer than the stamens. *Stigma* two-cleft, thickish.

* The *Cadam* of the Hindoos.
† The Germ is four-celled, and contains the rudiments of four seeds.

Pericarp: common, irregular, divided on the surface into irregular angular spaces; composed of berries pyramidal, compressed on all sides by the adjacent ones, and concreted with them, lopped, containing, towards the base, a fleshy pulp.

Seeds in each berry four, towards the point oblong, externally convex, internally angular.

The species here described is called by *Linnæus*, *Morinda arborea pedunculis solitariis;* and he gives it the trivial name of *citrifolia;* but the form of the leaves, in all the specimens I have seen, does not exhibit this similtude, as will appear by the inspection of the accompanying figure, which was drawn from nature. There are figures of it given by *Rumphius* (Herb. Amboin. vol. 3. tab. 99) who calls it *Bancudus latifolia;* and by *Rheede* (Hort. Malab. vol. 1. tab. 52) who calls it *Cada-pilava.* In *Malava* it is called *Aal;* and in *Oude* it has the name of *Atchy.*

The plant grows best in a black rich soil, free from stones, in situations moderately moist, not too high, yet sufficiently elevated to prevent the water of the rains from stagnating; and where there is near at hand a supply of water for the dry months. It is sown about the middle or end of *June*, after the rain has begun to fall. The ground requires no manure, it is ploughed twice, or, if tough and hard, three times. The seed is sown, either broad-cast, or in drills, according to the fancy of the cultivator. The ground is then ploughed over again, and harrowed. In one *beegah** of ground are sown, from 1½ to 2½ *muns*† of seed. In fifteen or twenty days the young plants spring up. The field is then carefully weeded, and the grounds stirred with an iron instrument.

* A measure of one hundred cubits square.

† The *mun* of this country is sixteen *seers*, of eighty rupees weight each.

This operation is repeated, at proper intervals, during the first year; and in the dry months of that year (that is, from *January* till *June)* the ground is three or four times laid under water. After the first year, it requires no farther care. In a year the plant grows to the height of one or two feet, according to the quality of the soil. In the third year, sometimes in the second, it bears flowers and fruit. The flowers appear in *June*, and the fruit ripens in *September* or *October:* but the fruit of those young trees is not used for seed, as it is said not to produce vigorous plants. In the months of *February* and *March* following the third year, the plants are dug up. They dig to the depth of three or four feet; the root, which is the only valuable part, extending so far into the ground. The wood of the plant is only used for fuel. Sometimes the necessities of the husbandman oblige him to dig the crop in the second, or even at the end of the first year; but the root is obtained in much smaller quantity, and less rich in colouring matter, than if it had remained the regular time. The crop is not much affected by the excess or defect of the periodical rains. When it is dug at the end of the third year, one *beegah* yields from four to six *maunies** of the root in a wet state. These are spread on cloths, and dried in the sun for three or four days; at the end of which time there remains of dried root, one third or one fourth part of the original weight.

As the colouring matter resides chiefly in the bark of the root, the small twigs, which contain little wood, bear a higher price than the larger pieces. Therefore the roots, when dug up, are separated into three kinds, coarse, medium, and fine. The coarse sells for one rupee per *mun*, the medium two or three rupees, and the fine four rupees per *mun*, or four seers for a rupee.

* The *mauny* contains twelve *muns* of this country's weight.

In particular fields they leave trees for seed at the distance of four, five, or six cubits. In six years they yield fertile and vigorous seeds. The trees, when of that age, are about six inches in diameter, and twelve feet high (branches included); but they continue fruitful for many years, and are said to grow to a size not much inferior to that of a *Mango*-tree. When the fruit is ripe, it is gathered, laid in heaps on the ground, and covered up with straw, or other rubbish, for fifteen or twenty days, in which time the pulp rots, and is consumed. It is then put into a basket, and washed, by repeated effusions of water, to separate the seeds and free them from the remains of the pulpy matter. The husbandman, who cultivates the plant, generally takes care to have on his ground a sufficient number of trees for seed. If he is unprovided with those, he may purchase the seed, immediately after it is prepared, for four or five rupees the *mun;* but if he neglects to purchase till the season of sowing arrives, he may be obliged to pay at the rate of two seers per rupee.

In the ground on which *Aal* has grown, they sow wheat, or other grain, for five or six years; and it is observed, that the grain sown on this ground thrives remarkably: and while the trees left for seed continue small, grain of any kind may be sown in their interstices; but *Aal* would not thrive there.

The expense to the cultivator varies considerably in different villages. In one, where the plant is cultivated to considerable extent*, the pateil, or zemindar, gave me the following account of the expense attending the cultivation of one *beegah.*

Khelana, 7½ miles from *Oujein.*

To the Collector of the District	Rs.	10	
To the Pateil - - -		1	
To Writers, &c. Servants of the Pateil		0	10
To digging up the Root* - - -		15	
Total		26	10

Now supposing, agreeably to the foregoing account, that a good crop is six, and a bad one four, *maunies;* that each *mauny* yields, when dried, 3½ *muns*, and that in this dried root, the coarse at one rupee, the medium at two, and the fine at four, are in equal quantities; then, the value of the good crop will be 49 rupees, and that of the bad one 32, 10, 8. The first of these leaves Rs. 22, 6, the other Rs. 6, 0, 8, from each *beegah*. The medium, Rs. 14, 3, 4, we may estimate as the profit of the husbandman, out of which he is to maintain himself and his cattle for three years. In this account I have not included the expense of seed, as the cultivator is generally supplied with it from his own trees. Had he been obliged to purchase it, we must have added eight rupees to the expense of cultivation: but, as the crop sustains no damage by remaining in the ground, the cultivator can dig it up at his leisure; and therefore he generally saves by his own labour, great part of the expense above stated for digging.

In another village†, the cultivator has the land on much easier terms; only paying three rupees for the crop, or one rupee yearly, to the collector. Therefore, the other expenses being supposed the same, the crop only costs him Rs. 19, 10, besides his own maintenance and that of his cattle.

* For digging a space 16 cubits long, and 3½ cubits broad, the labourers are paid 4½ pice, at fifty to the rupee.

† *Rindwasa*, about the same distance from *Oujein* as the former.

Besides the consumption of the root in the manufactures of this province, large quantities of it are exported to *Guzerat* and the northern part of *Hindostan*. I have not been able to learn the exact value of this exportation, but have reason to believe that it amounts, annually, to some lacs of rupees. The dealers, who come from those places (especially *Guzerat*) to purchase, advance money to the cultivator, and, when the crop is ready, buy it, either on the ground, or after it is dug up. In the first case, they dig a small portion of the field, and, according to the quantity it yields, form a judgment on the value of the whole.

The method of dying with this root is as follows: The cloth to be dyed is thoroughly washed and scoured, with an extemporaneous kind of soap-lie, made by mixing the oil of sesamum with the fossil alkali. Then, supposing the cloth (which is generally of a thin texture) to be twenty-six cubits long, and one cubit broad, the quantities of ingredients will be as follow:

Take of large *Her** in powder, three ounces. Mix it well with four pounds of water. In this the cloth is to be thoroughly wetted, so that the absorption of *Her* may be as equal as possible. It is then to be squeezed, and spread in the sun for about forty-eight minutes, to dry, taking care that no drops of water fall upon it. The cloth, when dried, is of a cream-colour. It is kept in this state for four or five days, that the particles of the *Myrobalan* may be more firmly attached.

Then take of powdered alum, two ounces; dissolve it in lb ij of water. Wet the cloth thoroughly

* The *Chehule; Myrobalani maximæ, oblongæ, angulosæ.* C. B.

and equally in this solution. Wring it, and strike it gently on a smooth stone, then spread it, for twenty-four minutes, in the sun, to dry. When dried, it is of a pea-green colour. When perfectly dry, it is kept for four days, and then washed in cold water. To the manner and degree of washing, we are told, great attention is to be paid; as an error, either in excess or defect, would spoil the colour. When washed, it is dried in the sun.

The cloth thus prepared, is ready to receive the colour, which is prepared in the following manner: Put 3½ gallons of water into an uncovered copper-vessel, and set it on a gentle fire. When it is something more than lukewarm, put in the cloth, along with the colouring ingredients, which have previously been thus prepared. Take of *Aal*, from one to two seers, according to its quality, powder it, and rub it with two ounces of oil of *Sesamum* to each seer. Add of the flowers of *D'hawry**, one eighth of a seer

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* A shrub, which grows wild on the hills, and on the banks of the rivulets, where they are formed of a grassy sod. The flowers are of a beautiful red colour, and are gathered both for the use of the dyers and of the apothecaries, who give an infusion of them as a cooling medicine. They lose their colour in drying, and only yield a slight brownish tincture to water; so that the benefit derived from them in dying with *Aal*, seems to depend merely on their action as an astringent; which is confirmed by the substitution of *Puruvs*, a strong astringent, as an equivalent to *D'hawry*. The natural character of the *D'hawry* is as follows:

Cal. Perianth one-leaved, persistent; *Tube*, bellied; *Border*, six cleft; the divisions lanced, erect.

Cor. Petals six, lanced, acute, erect; a little longer than the calyx, arising from the edge of the *tube*, between the divisions of the calyx.

Stam. Filaments twelve (in some ten or eleven) awled, erect, longer than the calyx, and arising from it. *Anthers* kidney form, incumbent.

Pist. Germ oblong, two-furrowed. *Style* awled, ascending, the length of the stamina. *Stigma* obtuse.

to each seer of *Aal;* or, instead of *D'hawry*, one ounce and a half of *Purwás**, in powder.

The cloth and colouring ingredients are continued on the fire, with a gentle heat, gradually increased, for about three hours. Towards the end, the water is made to boil strongly. By taking up a little of the water, and examining its colour as it is dropped in the vessel, they judge of the success of the process. It ought to be of a clay-colour, or a little deeper. If it proves very red, the colour would be spoiled; and the remedy is, to add a larger proportion of *D'hawry*. During this process, the cloth is continually moved, by lifting a part of it with a stick out of a vessel, beginning at one end and proceeding to the other. It is now taken out, wrung, and dried: after which, being washed in river-water, the red colour is complete. No. 1 is a specimen of this colour, which is valued more for its durability than its beauty.

Peric. Capsule, ovate, acute, two-furrowed, two-celled, four-valved.

* *Seeds* numerous, very small: receptacle oblong.

Leaves opposite, lanced.

Here the oblong shape of the capsule and its two cells agree with the *Lythrum;* the divisions of the calyx with the *Ginora*. *Linnæus* (Ph. Bot. § 177, 182, 183.) alleges that the calyx is more to be depended on than the Pericarpium in ascertaining the genera of plants. Therefore, agreeably to these aphorisms, I should be inclined to refer the *D'hawry* to the genus *Ginora;* but it may perhaps be considered as a new genus to be placed in the system between the *Lythrum* and *Ginora*.

* A kind of gall-nut, containing the exuviæ of a small insect, found on a species of the *Mimosa*. In *Malava* it is called *Purwás;* in *Marwar, Succour;* and in the country about *Mongheer, Purwán*. This being a stronger astringent, we are told that an exact attention to the proportion of it is more necessary than to that of the *D'hawry*.

To make a Dark Purple, or Chocolate Colour.

Take of martial vitriol one ounce, dissolve it in two pounds of water, and clear the solution by decantation. Mix, with a quantity of the above-described colouring decoction, sufficient to wet the cloth, such a proportion of this martial solution as will give the tint required. This is judged by inspection, as the cloth will be of the same colour with the mixture. The cloth being taken out of the colouring decoction and wrung, is to be dipped into this mixture, and thoroughly wetted, so as to absorb the colour equally and completely. Then, being dyed, and washed, its appearance resembles that of the specimen No 2 and 3; but the tints admit of a great variety, according to the proportions of the martial solution. Both these colours are very durable, being little affected by washing. One of the quarters of *Oujein*, named *Jeysingpoorah*, is inhabited by dyers, who consume great quantities of this root. Their printed and stained cloths, besides supplying the domestic consumption, are exported to *Guzerat*, and other provinces.

ON

THE INHABITANTS

OF

THE HILLS NEAR RAJAMAHALL.

BY LIEUTENANT THOMAS SHAW.

A SLIGHT knowledge of the language of the natives of the hills, in the districts of *Bhágalpur* and *Rájamahall*, having brought to my observation that their customs and manners, as well as their language, differed from those of the inhabitants of the neighbouring plains, I have, for some time, endeavoured to acquire a good account of them, from the belief that, notwithstanding their connexion with, and dependance on, our government, they have been little known beyond the limits of the hills. The following description does not contain much more than a bare translation of what was written by the best informed mountaineer whom I have met with. I have spared no pains to render it faithful; for there alone it can have any merit. My information has been derived through a *Soubadar* of the *Rangers* (whom the late Mr. CLEVELAND had instructed in writing *Nagree*) as far as relates to the inhabitants of the hills in the three *Tuppahs* of *Mudjeway*, *Ghurry*, and *Munnúry*. The first is to the south-west of *Rájamahall*, extending as far as *Sicrigully*; the second is

thence in a westerly direction, as far as *Shawhabad*; and the third lies to the south of *Ghurry*, from whose people those on the borders of *Bheerboom*, and south-east of *Rájamahall*, differ in many respects. Whatever was material in these latter *Tuppahs*, was related by a *Soubadar* from that quarter to the one who can write; and both attended me in translating them. The *Tuppahs* of *Mudbun*, *Pyer*, *Chitoleah*, *Barcope*, *Putsundaw*, *Jumnee*, *Hurnah Par*, *Dumsai*, *Kuneeallah*, and others, have customs also peculiar to themselves. These I shall endeavour to ascertain.

The following relates immediately to the *Tuppahs* of *Mudjeway*, *Ghurry*, and *Munmúry*, from which may be collected what ideas the inhabitants have of one Supreme Being, of a future state, and of transmigration. It is true they worship many gods, but these are considered inferior to, and the medium of adoration of, one all powerful and omniscient Being; whom they call Bedo Gossaih, or the Great God. Their opinions on the metempsychosis, it is probable, have been borrowed from the *Hindus*, though they profess no particular veneration for the cow, or any other animal; for they believe it a punishment when God ordains a human soul, to transmigrate into any of the brute creation; and it is also a received opinion, that for certain crimes in this life, souls are condemned to the vegetable world.

The natives of the hills in these *Tuppahs*, having no knowledge of letters, or of any character, have a traditional story, brought down from father to son (but in what age it was received, is not now known) that the *Bedo Gossaih* made heaven and earth, and all that is therein. To people the latter, seven brothers were sent from Heaven. At first they remained together; when the eldest brother was sick, the six younger collected all manner of eatables, which they

agreed to divide, and to separate to go into different countries; one, a *Hindu*, got fish and goat's flesh in a new dish, for his share; a second, a *Mussulman*, was allotted fish, fowl, and every sort of flesh, except hogs, for his portion, in a new dish also; a third, *Kirwary;* a fourth, *Kirrateer*, got hog's flesh also in a new dish; a fifth, *Kawdeer*, got all sorts of flesh, fish, and fowl, in a new dish; a sixth, who was destined for a foreign country, got some of every sort of food, in a new dish; and after his departure, it was not known what had become of him, till *Europeans* made their appearance, when, from their manner of living, it was concluded that they were the descendants of the sixth brother; the seventh, *Mullare*, who was the oldest, and sick brother, got some of every kind of food, but put them in an old dish, for which he was considered an outcast, and ordered to inhabit these hills, where, finding neither clothes nor subsistence, he and his descendants necessarily became thieves, in which practice they continued, till such time as Mr. CLEVELAND wisely conciliated their attachment to the *English* government, by a liberal generosity and munificence, while he entered their hills unattended, putting the utmost confidence in their faith; and made engagements to settle on their chiefs an inconsiderable monthly sum, in consideration of their good and peaceable behaviour and obedience, to which they have rigidly adhered; and this, it is related, put an end to their predatory incursions and marauding. The *Kirwary* cast crossed the *Ganges* and lived in tents, having no settled habitation. The *Hindu* and *Mussulman* remained in this country. The *Kawdeer* went to the south; and this remained doubtful, till a party of them came to dig a tank for Mr. CLEVELAND. The *Kirrateer* went to the hills north of the *Ganges*. I cannot learn what names the brothers had, nor how they were provided with wives,

to increase and multiply: the creation of women does not bear any part in this defective account, which proceeds to relate, that GOD the Creator directed certain wombs to be fruitful. His commandments are, that men should give to such as will receive; and that, in like manner, others would give to them. By labour men must live; for this their hands were made; eyes were given to see with, the mouth to speak good and bad, as well as to eat sweet and sour, and the feet to walk. Abuse nobody without cause; neither kill nor punish, without a crime, or GOD will destroy you. These commands being sent, certain wombs were fruitful. But some men forgetting these divine ordinances, abused, beat, and oppressed each other without cause; when, the measure of their crimes being full, he summons them to his presence; the messenger carries sickness and death: On the sinner's appearing before God, being charged with forgetting his commandments, he is bound and cast into pits of maggots, or pits of fire, where he is to remain eternally.

Whoever keeps GOD's commandments, behaves well in all respects: he will neither injure, abuse, beat, nor kill, any person, nor seize their effects, nor plunder them, nor waste their grain, nor their money, nor their clothes, nor quarrel with any one; but praises GOD morning and evening; which last, the women also do. He will be charitable, clothe and feed the poor, and observe the festivals in GOD's name, with the proper expense of grain, money, and clothes. GOD, for the just disposal of the goods he had granted for keeping his commandments, and praying, summons the righteous person into his presence, on his having enjoyed this world long enough. On his appearance, he is asked how he dealt with men, and how they behaved to him. Having rendered his account, as well of what he bestowed and re-

ceived as of what he ate; that he injured nobody, but praised GOD morning and evening,—GOD answers, "I saw that you behaved well, and kept my commandments; I will exalt you; in the mean time remain with me." After a short sojourn, he is sent to earth, to be born of a woman again, and to be a *Raja*, *Dewan*, or *Cutwall*, with abundance of worldly goods and territory. Should he forget to praise GOD in his exaltation, and give not meat to the hungry, but oppress the poor, God, in his wrath, will destroy him, snatch him away, and accuse him of neglecting his commandments, and forgetting to praise him. He will then cast him into a pit of fire, where, should not his punishment be eternal, he will not allow him to be born again of woman, but to be regenerated in the shape of a dog or cat.

Whoever offends in the presence of God, is dismissed to this earth, to be born of women, either blind, lame, or in poverty, never to have house, clothes, or victuals, nor any thing but what is begged from door to door. Should a person possessed of rank, grain, clothes, land, and every thing he could want, forget GOD's commandments, seize and plunder from others, —GOD, in his wrath for the abuse of the good things which he had bestowed, will make him poor and a beggar; and having decreed that he shall remain a certain time on earth for his punishment, this being fulfilled, death snatches him away, and he appears in the presence of GOD. GOD orders a man to kill another, and he kills him, yet lives happily and content; but no one must, from his own will and pleasure, destroy a fellow-creature, or GOD will destroy him. GOD orders a man to beat another, and he beats him; but whoever punishes a fellow-creature, without divine commands, the Supreme Being will direct a third person to punish the offender. No person shall abuse another without GOD's commands:

whoever disobeys, will in like manner be abused by a third person.

Whoever without God's commands injures his neighbour, may expect divine retaliation. Should a man, seeing his neighbour's property, plunder or steal it, the BEDO GOSSAIH will either order him to be punished in like manner, or some of his family to die. Should you see a man lame, mock not at his misfortune, lest God should make you lame, or punish you in some other manner. Laugh not at a man who has the misfortune to be blind, or GOD will afflict you in like manner, or some other way. It has pleased Providence that a man should have his back broken; whoever laughs at or mocks him, will be afflicted in like manner; GOD will make him blind, or lame, or poor; therefore mock not the unfortunate. If GOD had made the lame, the blind, the broken-backed or poor, to be laughed at, he would have pardoned such as mocked them; but as their defects are punishments, those who are perfect should not deride their misfortunes. Those on whom GOD bestows grain, riches, land, and power, ought to be charitable, and to cherish the unfortunate. Should they, notwithstanding their wealth, be uncharitable, Providence will punish them, by rendering them poor, and reducing them to the necessity of working for their bread. When great men are charitable, GOD will protect them.

GOD directs the poor to the rich man's door to beg; should the latter uncharitably refuse to relieve their wants, Providence will be displeased at the abuse of the good things which he had bestowed, and will render the rich man poor, helpless, and destroy his family. God can exalt the poor man. Such are the dispensations and power of Providence. A man robs and kills another, and casts the body

away to conceal the murder from the relations of the deceased, who conceive their kinsman to have been killed by a snake or tiger; but God cannot be deceived: vengeance will fall on the murderer, or his relations; he, or some of them, will fall a sacrifice to a tiger or a snake; divine vengeance will surely await him. Whoever kills a tiger without divine orders, will either himself, or some of his relations, fall a sacrifice to a tiger.

From such superstition, the natives of the hills are averse to killing a tiger, unless one of their relations has been carried off by one; when they go out for that purpose, and having succeeded, their bows and arrows are laid on the body of the animal, they invoke GOD, and declare that they killed it to retaliate for the loss of a relation. Vengeance thus satisfied, they vow not to attack a tiger, without the provocation of losing a kinsman.

GOD sends a messenger to summon a person to his presence: Should the messenger mistake his object, and carry off another, he is desired by the Deity to take him away; but as the earthly mansion of this soul must be decayed, it is destined to remain mid-way between heaven and earth, and never can return to the presence of GOD. Whoever commits homicide without divine orders, can never appear in the presence of the Deity; his soul is destined to remain mid-way between heaven and earth. Whoever is killed by a snake, as a punishment for some concealed crime, can never appear in the presence of the Deity; his soul is doomed to remain mid-way between heaven and earth; yet GOD will destroy the snake: but, if it acted by divine orders, Providence spares it. Should a rich man call the poor, with promises of giving them alms, and not perform them, and should the poor exhort GOD to make him poor too, for his

uncharitable deceit, Providence will either punish him in this way, or some other; but by penance and prayer he may be pardoned. As a man marries a woman at a great expense, should she be guilty of infidelity, and conceal the sin she had committed, which is the greatest aggravation of it, GOD will be incensed and punish her, by making her sick, lame, or blind. Whoever commits fornication, and conceals it, may dread divine vengeance. To avert falling sick, or being otherwise punished for his crime, he must avow it, pray to be forgiven, and sacrifice a goat at *Dewarry Nad*, the shrine of their household GOD, the blood of which is to be sprinkled over the linen, to purify him. If a man casts a lustful eye on his neighbour's wife, GOD will punish him; for it is forbidden. Whoever takes poison and dies, can never go to Heaven; his soul will be doomed to wander eternally; he will be convulsed and vomit, with no more than the daily allowance of as much rice as can be put on an *aura*-leaf (which is smaller than the *tamarind*-leaf) and as much water. Whoever hangs himself, shall never appear in the presence of GOD; his soul will have no place assigned it; but he will be doomed to wander eternally with a rope about his neck. Whoever drowns himself, shall never appear in the presence of God; his soul shall remain midway between heaven and earth; and GOD has ordained, that whoever drowns himself, shall be doomed to work eternally, day and night, without intermission, to make the crooked banks of a river straight, where the stream ever undermines, as fast as the labourers incessantly work. Whoever, undirected by the Deity, has the misfortune of being killed by a fall from a tree, his soul is received into the kingdom of heaven, but not admitted into the presence of the Almighty: it is, however, served with such things as are provided for the righteous. Whoever receives favours, and is guilty of the ingratitude of abusing his bene-

factor, will not be well treated in other places; GOD will expose him to misery for his ingratitude. Whoever falls in battle, is well received by GOD, and fares sumptuously; for the Deity is pleased with his fate. Whoever is lost travelling by water, is well received in Heaven: the Deity will take him unto himself.

The *Demaano*, or *Dewassy*, seems to be more of an oracle than a priest. Those who wish to initiate themselves, represent that, by dreaming, they can foretel what will happen; that the BEDO GOSSAIH appears to them nightly, and braids their hair, from which it grows remarkably long; they must never cut it; as it is believed, if such an act did not prove fatal to them, that, at least, their dreams would no longer be prophetic. This oracle foretels to one person, that he shall have a plentiful harvest; to another, that he shall become rich; a third is told, that he is to fall sick; a fourth, that he shall die; a fifth, that he shall be successful in hunting. A family is admonished to sacrifice and pray at a certain shrine, to appease an offended God; he prophecies when there will be a scarcity, and when it will rain. Thus, his predictions being verified, the people have faith in them; and one, who is sick, attends him for advice, which is afforded the following morning, when the *Demaano* has dreamt of the case, or GOD, having appeared to him in his vision, informed him what will be the fate of the patient, and what he must do to get well. Another informs him, his crops are not so good as usual, and desires to know which God is offended, and what he must do to appease him. A sportsman informs him, that he is not so fortunate as usual, and seeks to know what he must do to be so. Some ask, at what shrine they must make their offerings. All who consult this oracle must make a present, and return the following day for an answer.

On the first full moon of *January*, after his inspiration, he sallies out of his house, runs about, and pretends to be frantic: but neither injures nor speaks to any one. He approaches the door of his chief, and makes signs to have a cock, and a hen's egg, brought to him: the latter he immediately eats, and wringing off the head of the cock, sucks the reeking blood, and throws away the body; whence he proceeds to unfrequented rivers and jungles, where he remains seven, or nine days, and is supposed to be fed by the Deity, whom he represents on his return, and when his reason is restored, to have treated him sumptuously; that God had sometimes seated him on a large snake, and, at others, made him put his hand into the mouth of a large tiger; but without fear of any danger. On the *Demauno's* emerging from his retreat, he brings with him a large *plantain*-tree, which he had torn up by the roots, and places it on the roof of his house; then returns, and brings in a large *seedee*-tree; again, brings in a *muckmun*-tree; and lastly, a *seege*-tree; all of which, to the astonishment of the people, he, without human assistance, places, in like manner, on the roof of his house. It is to be understood that these trees are too large for one man to pluck from their roots and carry; and that the *seege*-tree is full of thorns, which cannot be touched with impunity; but, by divine aid, he effects these wonders. On the night of his return, he represents, that the BEDO GOSSAIH appears to him in a vision, and desires him to sacrifice a pigeon or a cock to him, with prayers. Accordingly, in the morning, having recovered his senses, he takes some oil to besmear the trees he had deposited on the roof of his house, and some red paint to make streaks on them; over this he scatters some undressed rice, and lastly, sacrifices the pigeon, so that the blood may fall on the trees; and, during this ceremony, he prays.

Henceforward he must never sit with or touch any woman but his wife; should any other woman even touch him by accident, it is supposed his predictions would fail; or should he marry more than one wife at a time, the people would have no faith in him. Having thus passed his novitiate, and obtained the reputation of a good *Demauno*, he is invited by his chief to the buffalo-festival, who puts round his neck a red silk thread, with five cowries strung on it, and binds a turban on his head, beseeching GOD that he may have power of restoring health to the sick, exorcising such as are possessed of devils, and that all his predictions may prove true. In this manner he is ordained, and officiates at the festival. A *Demauno* drinks of the reeking blood of all offerings sacrificed while he is present. He must never eat beef, or *dhai*, nor drink milk; for, in doing so, his prophecies would fail. There is no fixed number of *Demaunos* for the duty of a village: some have several, while others have none. The *Maungy* of every village sacrifices a buffalo in either the month of *Maug* or *Phagun*, annually: he fixes a day, and desires his vassals to attend, each of whom contributes a portion of grain, oil, or spirits for the festival: provisions being collected on the day appointed, the *Maungy* directs his followers what to do. Some cook, others go and cut a large branch of the *muckmun* (or *sicwa*) tree, which is brought, and planted before the *Maungy's* door, one of whose family carries out the *kundone* (a sacred stool, with four feet) and places it under the shade of the *muckmun*-branch, washes it, rubs it with oil, spots it with *(soondra)* red paint, and binds it with a thread of red silk; the *Maungy*, having made his *salám* to the stool, sits on it; the *Demauno*, or priest, sits on the ground to his left, and prays first; after which he gives the *Maungy* a handful of unboiled rice, which he scatters close to the *muckmun*-branch, addressing himself to GOD, to protect him and his de-

pendents, and to be propitious to them, adding a vow to perform and hold this festival annually. During the time of praying, the *Maungy's* drums are beating, that all within hearing, who are possessed of devils, may run, and pick up the rice to eat: having gathered it all, they are seized, bound, and taken to a small distance from the altar, when the buffalo, with ropes on all his legs well secured, is hamstrung by the *Maungy*, to entertain his barbarous followers, in order that they may be diverted by his struggles and exertions, in forcing him to the *muckmun*-branch, where his head is cut off; and the persons possessed of devils, who were bound, are set at liberty, and immediately rush forward to take up the buffalo's blood, and lick it while reeking. When they are supposed to have enough, they are besprinkled with water, which renders them completely exorcised, and they retire to a stream to bathe: the adherents come forward with their offerings of rice, oil, and spirits, and receive a blessing from their chief, who has the buffalo's head dressed, and eats it with the priest and musicians: the *kundone* being taken into the house, puts an end to the ceremony of the day. The next morning the adherents assemble to feast on the buffalo and other things which the *Maungy* furnishes. At the expiration of five days a fowl is immolated, and the blood sprinkled on the *muckmun*-branch, which is taken up, and with the horns and some of the bones of the buffalo, is fastened on the roof of the *Maungy's* house, where they are left to decay. In some places stages are erected for these sacred fragments, at the north-east angle of the *Maungy's* house. The chief *Maungy* of a *tuppah* (which is a number of hills that have villages on them) whose authority is acknowledged by the *Maungies* of the several villages in his limits, appoints a time annually to pray, that they may have rain enough for their crops. This festival may be held in any month in the year, except *Poos*,

in which they neither marry, build a house, nor undertake any thing of consequence, considering it an unlucky month. The chief of the *tuppah* having determined on a day, sends an *arra* to the *Maungy* of each village, desiring him to attend with twenty or thirty of his men by the day fixed on: when assembled, they all repair to the place established without the village, for the ceremony of the *Satane:* having planted a small branch of the *chagulno* (*bale*-tree) the head of a goat is severed with a sword, that the blood may fall on the leaves of the *chagulno:* the *Satane* is then resorted to, to ascertain what chief will be most acceptable to the GOD of Rain, to pray on this occasion; this being settled, a day is named for prayer, upon which all the *Maungies*, with their vassals, assemble at their chief's, before whose door the *Demauno* and the *Maungy*, on whom the *Satane* election had fallen, pray: after which a buffalo is sacrificed, and the same forms observed as described in the buffalo-festival: it continues as long as the provisions which were presented by the several *Maungies* last. The danger of a scarcity is thus supposed to be averted, and that their crops will flourish.

When a *Maungy* has established a village, should a tiger infest it, or the small-pox, or any plague prove fatal to its inhabitants, it is supposed that RUXEY GOSSAIN is desirous of having a shrine raised. The *Satane* is resorted to, to confirm the supposition, and the *Demauno* consulted. On both agreeing, these steps are sufficient to stop the ravages of any beast of prey, and to avert any further fatality from the small-pox. Thus relieved, the *Maungy* calls the *Demauno* to get *ruxey* (a sacred black stone) for him; in compliance with which the *Demauno* has a vision, in which the Deity appears to him, and informs him where the god RUXEY is to be found, directs him to

the spot, and desires him to raise him with his own hands, and to present him to the *Maungy* in the morning. The *Demauno* gets a branch of the *seeedee* (a tree peculiar to the hills); benjamin is burned before the *Maungy's* door, which he smells, and proceeds, followed by some men to the spot where RUXEY is to be found; having smelt the godhead, he directs the persons who were in attendance to dig for him: to facilitate their work, water is thrown, to soften the earth; and when RUXEY is discovered, the *Demauno* takes him up, and carries him to the *Maungy*, who immediately sets out, with his divine present, in search of a large tree, about half a mile, or less, from the village, under the shade of which he places it, and encloses it by a fence of stones, and a hedge of *seege:* a fowl and a goat are sacrificed to the god, whom the *Maungy*, or some other acceptable person (and it is the object of the *Satane* to find out who is most virtuous and most worthy to address the god) worships and retires.

At any other time when this god is worshipped, a fowl and goat are sacrificed; and the *Maungy*, or person who prays, is attended by two drummers and an old man, who has no wife, and, from age, has no connexion with women, to partake of the offerings with the preacher; of which others, who have forsworn all connexion with women and drinking intoxicating liquors, may share. Whoever violates this vow by drinking or cohabiting with women, it is believed, will become foolish, yet he may recover his reason by asking pardon of the god, and by offering a fowl and goat, with prayer in sacrifice at the shrine; but he can never be a *Hook Moko*, or an elect eater, again.

[illegible] men and women must not approach or profane the place where RUXEY is deposited, by spitting

towards him, or by doing any uncleanly act near it: should any person, through forgetfulness, or ignorance, be guilty of any such acts, by spitting, he will get a sore mouth; and other more offensive transgressions are productive of a strangury, or flux, respectively; and these diseases are often considered as the effects of some heedless transgression of the above nature, which is discovered by the *Satane*, or such like proof: their remedy is to give a fowl to the *Maungy*, who makes an offering of it to the god, who is thus appeased. If the patient recovers, well; if not, the friends go to a neighbouring village, to find out, by the *Satane*, the cause of their relation's illness: if he is not thus relieved, they go to a second; and, on failing, they consider it as an affliction by the dispensation of the Supreme Being, who will either spare, shorten, or prolong the life of the offending patient, according to his will.

The *Chitaria*-festival is held but once in three years. The celebration of it so seldom is, probably, from its being very expensive to the *Maungy*, who bears the charge. It is not every village that has a *Chalnad*, though he is considered as the GOD that presides over the welfare of villages; but, like RUXEY NAD, he is not supposed to be essential to their happiness till the inhabitants are harassed by some plague or pestilence; when the *Demauno*, on being consulted, informs the *Maungy* that this Deity is desirous of having a *Nad* raised; that effecting this, and worshipping him, will put an end to their misfortunes. The *Demauno* then dreams of the place where this shrine is to be found, in the shape of a black stone; he proceeds in the morning to discover it, observing the same forms as are described in obtaining RUXEY NAD; when found, the stone is placed under the shade of a *muckmun*-tree contiguous to the village, and undergoes no alteration in its form from the chissel.

Among the preparations for the *Chitaria*-festival, the *Maungy* must provide a cow and a piece of red silk, previous to the day fixed for prayer. The *Satane*, as usual, is performed, to find out what two of the *Maungy's* vassals will be most acceptable to the godhead, to pray. This point being settled, and every thing ready, a day is fixed: on the eve of this holiday, the piece of silk is cut in two, and one part given to one of the wives of each of the preachers, with whom their husbands have not cohabited for ten or fifteen days previously. The *Demauno*, *Maungy*, *Cutwal*, *Phojedar*, *Jemmadars*, and *Bundareens*, having been invited into one of the preachers houses, the *Demauno* gives water to two *Kalewars*, one *Dolewar*, one *Mangeera*, and one *Jelaum*, to wash their hands; and these musicians are taken into the house: a feast is served, of which all present partake, as soon as the chiefs have thrown a little of each dish away, in the name of CHALNAD. I must here digress, to observe, that it is a custom through all the hills, to throw a little of their meat away at every meal, previous to their eating; and the same rule is observed in drinking; the intention of which is, to avert any bad consequence from any devil or evil spirit having defiled it. The *Bandareens*, whose particular province it is at all festivals to serve out the *toddy*, or spirits, perform that office; and the chiefs, having spilled a little also in the name of CHALNAD for a libation, the party drink and sing all night, in praise of CHITARIAH GOSSAIH, invoking his protection, the musicians, or rather drummers, beating at the same time. Should any person sing a different song, he is fined a fowl, which is sacrificed, and the blood sprinkled over the whole party. During the course of the night, they patrole the village five times, leading a cow with them; in the morning, the *Demauno*, the two preachers and drummers, proceed to *Chalnad* with the cow. Having finished their prayers, the cow is sacrificed by

one of the preachers, in such a manner that the blood may fall on the shrine: a feast is immediately made of the flesh, and all the men who accompanied them from the village, except such as may be disqualified from domestic causes, partake of it. On their return to the village, they send notice of their approach, that the two wives of the preachers, between whom the piece of silk was divided, may take off their clothes and ornaments, and tie the silk round their middles, covering them from their waists to their knees: their hair is fastened in a knot on the crown of their heads; and every part of their body which is exposed, is spotted with a mixture made of turmeric, powdered, and the heart, or white part, of *Indian* corn, which is finely ground for that purpose: part of this is also sent to the preachers, that they may be spotted in the same manner, and with it the halves of four mats thus prepared. The two women (the whole village, men, women, and children, being assembled to see the procession) set out, one following the other, and taking care not to advance the foot which is up beyond the toe of that on the ground, to meet the preachers, who observe the same pace as their wives; and the mats, as the parties pass over them, are always taken up and placed again before. Having passed each other, the women take place behind the men, and follow them by the same step at which they first set out, to the house of one of the preachers: when arrived, the men taking one side, and the women the other, they wash and change their clothes. Here the ceremony ends; and the preachers, with their wives, are invited to a feast at the *Maungy's*.

The above is the only festival where women can assist or bear any part, as a woman never prays in public on these hills. It has before been said, that they are to recommend themselves to the protection of the Su-

preme Being, morning and night. During the time of the above festival, the compliment of a *salam* is not paid to any person.

Pow Gossaih, or the God of the Road, or Highway, is the first worship young men perform; though it is not undertaken till some accident has induced the person to consult the *Cherreen*, or *Satane*, whether his praying and making an offering will be acceptable. This trial is perhaps of itself sufficient to confirm the opinion, that Pow Gossaih is offended; therefore the young suppliant vows to worship him. On the day of thanksgiving, on which the new *Takalloo* is first eaten of, or on the day appointed for the new *Kosarane*-harvest, he proceeds to a high road, and cleans and washes a small space under the shade of a young *bale-tree:* in the centre of this he plants a branch of the *muckmun*-tree; round it he makes marks and spots with red paint, and with a handful of rice, which he lays close to the branch, placing a hen's egg on it, on which three streaks of red paint were drawn, he invokes the Supreme Being, and God of the Road, to protect him while travelling, and sacrifices a cock, the blood of which is thrown on the *muckmun*-branch: the offering, being dressed with rice, is eaten by the suppliant, and such as may have attended him. The ceremony ends by breaking the hen's egg; and is never repeated by him unless he should again meet with some accident while travelling; on which the *Cherreen*, or *Satane*, is resorted to, for a confirmation of the apprehension that it was caused by Pow Gossaih's resentment, and his desire of being worshipped.

Dewary Gossaih, or the God who is supposed to preside over the welfare of families, is the second worship which men perform: there is no fixed time

for it. He who discovers by the *Cherreen*, or *Satane*, that the welfare of himself and family depends on his holding this festival, distils spirits, purchases a hog, rice, red paint, and oil; and, having fixed on a day, invites his *Maungy* and friends on the day appointed: a small space before the threshold is brushed and washed, and a branch of the *muckmun* planted on it: on this some red paint is put, as well as marks made round it. The *Maungy* and his officers are taken into the suppliant's house, when pots of spirits and provisions are given to the former, as well as meat and drink to all the company. After a short repast, the suppliant, with a hen's egg and a handful of rice, approaches the *muckmun*-branch, close to which the former is deposited on the latter. During this ceremony he implores the Supreme Being and *Dewary Gossaih*, to be propitious to him and family. The hog is sacrificed by a relation, as an offering to *Dewary Gossaih*, with professions of again observing the festival whenever *Dewary Gossaih* may desire it. A feast is made with the oblation; and, at the conclusion, the suppliant breaks the egg, and pulls up the *muckmun*-branch, which he places on the roof of his house.

Kull Gossaih, or the *Ceres* of the mountaineers, is worshipped annually by cultivators, in the season of sowing their fields: the proper time is ascertained by consulting the *Demauno*, and confirmed by either the *Cherreen*, or *Satane;* and is attended with more or less expense, according to the means of the suppliant. If poor, it is deemed sufficient to make an offering of a cock; those who can afford it, purchase a cut hog and a cut goat, distil spirits, buy rice, red paint, and oil, and invite the *Demauno* to assist them in praying, as well as their friends, chiefs, and neighbours, to a feast. On the day appointed, the *Demauno* goes early to aid in distilling spirits,

and in other preparations for the feast: the chiefs and others, having entered the suppliant's house, are presented with meat and spirituous liquors to drink: the *Demauno* is also introduced with two *Kalewars* and one *Dolewar:* he, and the suppliant, and the *Maungy*, facing the middle supporter of the house, pray for the welfare of the master, making a libation, and throwing down some meat, in the name of *Goomo Gossaih*, and of *Kull Gossaih:* the *Demauno* and suppliant burn incense, while the *Kalewars* and *Dolewar* beat, and the *Maungy* and chiefs eat and drink. After this, the suppliant proceeds, with the *Demauno*, musicians, and all who may be disposed to join in the procession, to his field, where, at the stump of a tree, having cleared a small space, and planted a branch of the *muckmun*, and prayed with the forms already described, burning incense,—the goat and hog are sacrificed by a relation of the suppliant's (who gets a rupee and a turban for this sacred office) so that some of the blood may fall on the *muckmun*-branch, and of which the *Demauno* pretends to drink a considerable quantity. He gives out that the blood digests in his throat, and does not pass into his stomach.

Of each of these offerings, the *Maungy* is presented with a fore-quarter for his family; and of the remainder all, except such whose wives are in their separation, partake. At the conclusion, the *Demauno* gives water to the musicians and the suppliant, to wash their hands, who return with the latter, and feast and drink at his house as long as any fragment of the provisions which had been prepared for the festival remains.

The *Demauno* having desired any person to worship *Goomo Gossaih*, and the *Chowren*, or *Satane*, having confirmed his ordinance, the suppliant must

rear a cut kid and a cut pig for that express purpose, about two years, more or less. Having acquired property enough to perform this promise, for it is attended with considerable expense, he sends invitations to his chiefs and vassals, to those also in the neighbourhood, and to his relations; and, to mark the time for the festival, a string, with a number of knots equal to the number of days that will intervene, is sent to each. From these strings, to avert mistakes, one knot is daily cut: in the interval the suppliant is employed in distilling spirits, and collecting materials, such as rice, oil, red paint, &c. when one knot remains, the guests assemble, and on the morning of the day appointed, some of the suppliant's neighbours, or relations, proceed to the jungles to cut three small *muckmun*-trees. Before the first is hewn, a cock is sacrificed, that the blood may fall on it, and some spirits thrown on it, as a libation to *Goomo*. As soon as the branches and bark are stripped off, two men are sufficient to carry each tree, and lay them without the village, where it is their business to prevent men, goats, or fowls, from touching them; and the suppliant, informed of their arrival, sends them drink for their trouble. In the mean time he takes the chiefs and their officers, with the two men who had prayed at the *Chitaria*-festival, into his house, and presents the *Maungy* with two pots of spirits and a hog: the *Demauno*, two *Kalewars*, and a *Dolewar* also go in. At their entrance, the *Demauno* gives water to the musicians, to wash their hands; he takes a small wicker-basket, containing about a *seer* of rice, on which he puts red paint, and places it with two pans near the middle supporter. During this the *Kalewars* and *Dolewar* beat, and incense is burning; the *Maungy* having made a libation, thrown out some meat, and sacrificed the hog in the name of the gods, he and the chiefs eat and drink.

The *Demauno*, suppliant, and musicians, repair to where the trees are; whence the trees are brought home, laid lengthwise, east and west, cut the proper length, and the suppliant and his wife sprinkle turmeric-water on them; the *Demauno*, mounting astride on the one which had been first cut, is carried five times round the house, when they are taken in, and, some earth being dug, are united to the middle supporter (which is called *Goomo*) being first spotted with red paint, and bound with a red silk thread. Incense is burned; and the *Demauno*, with a handful of rice, prays, laying the rice down, and placing a hen's egg on it, which has been previously thrice streaked with red paint: the suppliant, receiving a handful of rice from the *Demauno*, also prays, throwing it on the egg, when one of his relations brings up the fat goat, and sacrifices it so that the blood may fall on the *Goomo*. For this sacred office he gets a rupee and a turban. The *Demauno*, suppliant, and musicians, and all who may be disposed to be of the procession, proceed to a field, where, sweeping and washing near the stump of a tree, they plant the branch of a *muckmun*, and round it and on it make streaks of red paint: incense is then burned, and with a handful of rice and a hen's egg, the *Demauno* and suppliant repeat the prayers and ceremony which had been observed in the house, when the fat hog and another goat are sacrificed by a relation. Some of the blood of these animals must fall on the *muckmun*, and the *Demauno* drinks of it.

A fore quarter of each of the offerings being sent to the *Maungy*, they feast and return: previous to entering the suppliant's house, the *Demauno* gives him and the musicians water to wash their hands. The relations of the suppliant attend him, present him with spirits and a cock each, and anoint him,

his wives, and children with oil: he sacrifices the cocks, makes a libation, and throws away some meat in the name of *Goomo:* they feast and drink for two or three days, and then repair to their homes. On the fifth day the ceremony concludes, by the suppliant sacrificing a cock to *Goomo Gossaih*, and another to *Kull Gossaih.*

Goomo Gossaih is also worshipped as above, with this difference, that the suppliant does not eat, drink, or smoke in his house, or partake of any thing that had been in his house, for several days before the festival; nor is he allowed to partake of the offerings: and this prohibition continues for five days after the festival, which is called *Oogoss Goomo Gossaih.*

The worship of *Chumdah Gossaih* is so expensive, that none but chiefs, or men of property, can ever afford it, and these not oftener than once in three years; and therefore the votaries to this shrine most frequently exceed that period for so expensive a ceremony. They first consult the *Demauno,* and have recourse to the *Cherreen* and *Satane;* both of which must agree with what the *Demauno* prescribes, before this festival can be held: when thus ordained, the suppliant must provide about a dozen hogs, as many goats, about three score seers of rice, two of red paint, fifteen of oil; about twelve rupees must be expended in spirits, and some scores of cooking-pots, dishes, and cups for drinking, laid in, as well as a few peacock's tails, a fan, three bamboos, nine score *natâria*-trees, and some red stones, which are ground for paint, and also some charcoal. Thus prepared, the suppliant sends strings, with knots numbering the intervening days, with invitations to his relations and neighbouring chiefs. On the day appointed, some thousands assemble, and are variously employed: Some

grind the red stone for paint, others charcoal to mix with oil, while a great number are occupied in stripping the bark off the *natâria*, which is effected in one piece of four cubits long, by bruising it; three bamboos are then made straight by oil and fire, and are of the same length with the *natâria*-bark; a fat hog, grain, and several pots of spirits, are sent to the workers. The red stone and charcoal being ground, are mixed separately with oil, and a quantity of hog's blood added to both: the barks of the *natâria* have about a cubit of the lower end of each blackened with the charcoal, another cubit is left of the natural colour, and above it one cubit is painted red; caps of wood are fitted on the bamboos, and necks made in them: on one of these, four score and an half of barks are bound with twine dipped in oil; on the second, three score are bound, and on the third, one score and a half; the heads of these three are ornamented with a profusion of peacock's tail-feathers, thus prepared; they are called *Chumdah Gossaih*, and carried to the suppliant's house, where, for the workmen, a hog is dressed with grain, that they may be feasted for their trouble: a hog, two pots of spirits, grain, and salt, are presented to every chief, for himself, and vassals, who honours the suppliant with his company; as much is also given to his own relations, and a like quantity to the relations of his wives, and meat and drink is distributed to all assembled. The women, who dress these provisions, exclusive of their daily hire, have a hog given to them, that they may eat together, as they are not allowed to feast with the men.

The *Chumdah*-bamboos having been brought about evening, and placed against the suppliant's house, he and the *Demauno* rub the ends on the ground with oil, and mark them with red paint; when the latter, with a hen's egg and a handful of rice, prays, observing

the usual ceremony, that *Chumdah Gossaih* may be propitious to the suppliant, who follows his example, and also makes an offering of a cut hog, which he sacrifices so that the blood may fall on the bamboos; the largest of which, or one with the greatest number of barks pendant to it, he presents to one of his relations; the second in size to one of his wives' relations; and the third to any volunteer. The three persons thus favoured, support the *Chumdah* by cloth tied round their waists, and balance them with their hands, dancing as long as they can: when fatigued, they are relieved indiscriminately, without any distinction, and this amusement, with music, continues all night. In the morning the *Demauno* and suppliant pray at the middle supporter of the latter's house, with the usual forms, when a cut goat is brought as an offering, and sacrificed by a relation: hence they repair to his field, taking with them the *Chumdah*, and again pray near the stump of a tree, where a small space is brushed and washed for the purpose, and a branch of the *muckmun* planted, in addition to the egg and rice deposited there by the *Demauno* and suppliant: a shrine for *Kull Gossaih* is washed, rubbed with oil, and paint put on it, and bound with a red silk thread, and placed close to the *muckmun*-branch, when a goat and two hogs are sacrificed by a relation, that the blood may fall or be sprinkled on the shrine *Chumdah* and branch. For this office he gets a rupee and a turban: the offerings being dressed, are eaten with grain: the party having feasted, return, bringing with them the *Chumdahs*, which are carried five times round the suppliant's house, and then placed against eaves, where they remain five days, at the expiration of which, a *seer* of *takallong* is served out to every person who applies for it at the suppliant's house; but four men are stationed at each of the four doors, that every person who goes out with the *takallong*, may receive a blow

with the open hand from each of the four men stationed at the door he passes out of. At the conclusion of this ceremony the *Chumdah*-bamboos are taken into the house, and suspended from the roof; the suppliant repairs to the field, and makes an offering of a hog, and prays at the shrine of *Kull Gossaih*, whence he returns and sacrifices a goat at the middle supporter of his house, with prayer: these offerings are dressed, and, as is customary, they feast on them.

When the *kosarane* (a small grain like what the lowlanders call *collye*) is reaping in *November*, or the beginning of *December*, a festival is held as a thanksgiving before the new grain is eaten of. Materials for a feast being prepared, a day is fixed by the *Maungy*, who invites the chiefs of the neighbouring villages. On the day appointed, the two men who prayed at the *Chitaria*-festival, proceed to *Chalnad* to pray, and sacrifice a goat, which, with some *kosarane*, is an offering at the *Nad* to *Chitariah Gossaih*. On their return to the village, the *Maungy* has his *kondone* brought out, on which he prays and immolates a fowl. During this, the *dungareahar*, or vassals, repair to their fields, offer thanksgiving, make an oblation to *Kull Gossaih*, and return to their houses to eat of the new *kosarane*. As soon as the inhabitants assemble at the *Maungy*'s house, the men sitting on one side, and the women on the other, the *Phojedar* presents a hog, a measure of *kosarane*, and a pot of spirits, to the *Maungy*, in the name of his vassals, by whom these had been contributed. On receiving them, he blesses his vassals, and exhorts them to industry and good behaviour; after which, making a libation in the names of all their gods, and of their dead, he drinks, and also throws a little of the *kosarane* away, repeating the same pious ejaculations; which ceremony is the commencement of the festivity and drinking that lasts for several days.

On reaping the *takallone* (*Indian* corn) in *August* or *September*, there is also a festival. Each man repairs to his fields, with either a hog, goat, or fowl, to sacrifice to *Kull Gossaih*, to whom he prays; and, having feasted, returns home, where another repast is prepared; and on this day it is customary for every family in the village to distribute a little of what they have prepared for their feast to every house.

Should any person eat of new *kosarane* or *takallone* before the festival and public thanksgiving at the reaping of these crops, the *Maungy* fines the offenders a cock; which is sacrificed by the two preachers at the shrine of *Chitáriah*.

The mountaineers are represented to have in general an amorous disposition; their solicitude and attentions, when in love, are said to be unceasing. If separated but for an hour, the lovers are miserable; they conceal their meat to present to each other privately. The lady dresses whatever nice things she can secrete from her parents, to treat her lover with; and he presents her with rings and beads, and treats her with toddy. They go to market, and exchange paun and tobacco; and, on their return, should they perceive an acquaintance, they separate, to avoid being seen in company; but by assignation soon meet again. They retire to sleep together; but seldom are guilty of that indiscretion which is irreparable, though the fine for such imprudent conduct, which the parties are afraid to conceal, is a hog and a goat to the *Maungy*, who sacrifices them on the spot where frailty made them transgress, and sprinkles some of the blood on them, to wash out the stain from his land, or rather to appease an incensed deity, who fails not to punish for such abominations. Thus when a virgin is deflowered with her consent, the blood of the offering is sup-

posed to atone for their sin. Should the couple agree to come together as man and wife, the *Maungy* proclaims it; and they are immediately considered to be married, without any further ceremony or expense. The man has the option of taking her for his wife: she however has the privilege of demanding a regular marriage, which implies the usual presents, and the time for the wedding is fixed.

Polygamy is allowed. A man may marry as many wives as his circumstances will admit of; that is, as often as he can defray the expenses of the nuptials. When he sees a girl whom he wishes to espouse, he sends a friend to her parents to ask her in marriage: they refer him to the lady. Should he obtain her consent, he acquaints the parents, who desire him to return to the suitor, to advise him of their acquiescence, and that he may prepare the usual presents of *poonate* (beads) and *tubacane* (a ring for the neck) to present to the lady; which being accepted, she is considered as betrothed to him; and he, as soon as he can procure money for the expense of the nuptials, must provide a turban for the lady's father, with one rupee; also a rupee and a piece of cloth for her mother; and a rupee and a piece of cloth for several of the nearest relations. These and the materials for the marriage-feast being provided, a day is fixed, on which the bridegroom, with his relations, proceeds to the bride's father's house, where they are seated on cots and mats, and after a repast, the bride's father taking his daughter's hand, and giving it to the bridegroom, he publicly admonishes him to use her well and kindly, and not to murder her; threatening to retaliate; but, if she should die a natural death, or by means of the devil, it cannot be helped. On the conclusion of this exhortation, the bridegroom, with the little finger of his right hand, marks the bride's forehead with red

paint; and the same little finger being linked with the little finger of the bride's right hand, he leads her out of the house to his own. At the expiration of five days, the bridegroom, with the bride, returns to her father's, well stocked with provision for feasting, and having passed two or three days with their parents, they go home, and the ceremony concludes.

A man dying and leaving widows, his younger brothers, or younger cousins of the first and second degrees, or nephews, may receive the widows as wives. If the parties agree on these occasions, the children go with their mother: if the widow prefers returning to her relations, the children under ten years of age go with her, and she is entitled to a rupee and a piece of cloth annually, for bringing them up. When arrived at that period of life, they are sent to the relation of their father who paid their mother for taking care of them. When a woman has ten children, her eldest brother may claim one; the right is acknowledged from custom, though it cannot be enforced. The child thus adopted by an uncle, is treated as, and has every privilege of, his own children. Should this son by adoption arrive at manhood, die, and leave property, it is equally divided between the adopter and the father of the deceased.

A man desirous of marrying a widow, deputes a friend to ask her in marriage. Should she consent, she refers him to her late husband's relations, the nearest of whom, for his acquiescence, is entitled to two rupees and a turban. The parents of the widow are next consulted. Should they approve, they are entitled to some trifling presents; on which the father gives his daughter's hand, exhorting the bridegroom, as related in the description of a marriage.

The red paint is not used on a second marriage: a feast concludes the whole.

A man cannot marry a relation, though he may marry his wife's sisters, except in the instance of younger brothers, cousins, and nephews, receiving one each, or more, of their senior kinsman's widows, who are treated and considered as wives, though there is no expense nor ceremony attending their union.

Should a girl be compelled by her parents to marry a man whom she dislikes, and should she be unhappy, and leave her husband, and in despair put an end to herself, the parents get a court appointed, to inquire how their son-in-law behaved to their daughter. If it should appear that he treated her cruelly, he is considered guilty of murder, and fined, but not so heavily as is common for the commutation of blood. If, on the contrary, it should appear that he behaved well to her, it is deemed suicide.

Should a married woman elope with a man, and the party be pursued, seized, and brought back, judges are appointed to try the man; who is generally fined one or two score of rupees. The husband may or may not receive his wife; and the seducer has to pay the fine.

A man convicted of having committed adultery, is fined twenty or thirty rupees: he is also obliged to furnish a hog, the blood of which, being sprinkled on the adulterer and adulteress, washes away their sin, and, it is believed, will avert divine vengeance: the ceremony ends with a feast, and, the parties thus purified, the husband and friends are reconciled. The adulteress in general reveals the secret; as a superstitious idea is entertained, that, if concealed,

the inhabitants of the village will be visited by a plague, or that a tiger or venomous animal will destroy them. When any of these happens, it is religiously believed to proceed from the immorality and evil doings of some individual, and as a punishment for some concealed sin; to discover which they have practices, in which they place implicit faith: one is called *Satane*, and is as follows:—A place large enough for a man to sit in, is brushed and washed, in the middle of which a small branch of the *bale*-tree is planted, and a person sits opposite to it; another supplies him with a few grains of rice, on a *bale*-leaf, some of which he throws on the branch, the remainder he is to eat; the person who gave it to him repeating, that he is to swallow it in the names of all the inhabitants of the village; in which should the sinner be, it is believed *God* will make him throw up the rice. Should this happen, he is next to eat some in the names of families, and again in the name of all the individuals who compose that on which the *Satane* proof falls. Another is called *Cherreen*, and is thus:—A stone is suspended to a string, which, it is believed, will be tossed to and fro, on the name of the village, family, and offender. The third is called *Gobereen*, and is of a more serious nature than the two former. A pot with some cow-dung, oil, and water, is put on the fire; when boiling, a ring is thrown in; each person approaches to take out the ring, calling on *God* to protect him if innocent, and to burn him if guilty. On this trial, it is believed the innocent will escape unhurt in taking out the ring, and that the guilty person will be severely burned, without being able to put his hand into the pot, as the mixture, it is said, will boil up to meet his hand.

When a married man has been detected in committing fornication, his wife or wives may insist on a

hog or goat being sacrificed, to sprinkle the blood over him. Being thus purified, it is believed this ceremony expiates divine vengeance, which would sooner or later alight on him or some of his family for this sin.

Witchcraft and sorcery are most firmly believed; and accidents or diseases which elude their little skill in medicine, are attributed to some person supposed to be skilled in these arts, who has bewitched them. When such a conviction is admitted, the *Cherreen* is consulted, and again the *Satape*, both repeatedly, till some person be named. To confirm this ideal proof, which is received as infallible, an ordeal is undertaken; and on the part of such persons (supposed to be bewitched) five men are employed who are qualified and acquainted with this mode of trial. Such as are born immaturely cannot be engaged in it. These five proceed to a retired place on the banks of a river, before day-light, taking with them wood of a particular kind, and make a fire to heat an iron: one of these is to touch the iron when red hot with his tongue, but is first to bathe. While he is performing his ablution, the others heat the iron: when red hot, a little rice is thrown on it, in the name of the person accused of witchcraft, and *Birmah*, the God of Fire, exhorted to do justice. If it consumes, he is considered guilty; if not, not: The *Tâtoo*, or person who touches the iron, keeping one foot in the water, puts the iron to his tongue, and must repeat it as often as nine times, if the first and second touch does not burn; which however cannot happen. On the *Tâtoo* being burned the party return before sun-rise; and, on their approach to their village, the friends of the sick person are called out to see the *Tâtoo's* tongue. The person accused may object to the trial, and insist on its being held over again, that two persons may go, on his part, to wit-

ness it. On this proof, the unfortunate person is seized and punished, till he or she acknowledges the crime. It must be also told who instructed him, or her, in the practice of this evil art. The *Chouraga*, or warlock, is now brought to the sick person, to exorcise him from his spell. Should he recover, the *Chouraga* is compelled to pay one rupee to him, one to the *Mahngy* of the village, one to the four persons who witnessed the ordeal, and eight annas to the *Tátoo*. On the other hand, should he die, the *Chouraga* must either suffer death, or redeem his life (at the option of the friends of the deceased) at the price established for the commutation of blood. Again, the friends of the *Chouraga* may retaliate on the person whom their relation accused of having instructed him in sorcery.

It is not uncommon for two neighbours to agree, when their respective wives are pregnant, that the offspring, in the event of there being a boy and a girl, shall be married to each other. On these occasions, the ceremony may be performed when the parties are about eight or ten years old. Should the father of the girl violate the engagement, and give his daughter to another person, the father of the boy will obtain a fine equal to the expense of a marriage, which is rated according to their circumstances: whereas, should the father of the boy, notwithstanding his contract, marry his son before he has performed his part, the father of the girl is entitled to a fine of a turban and one rupee: after which it may still be performed or not, as the parties mutually agree.

When a woman is in labour, four or five of her relations and neighbours assemble to attend her: among these, the most experienced does the duty of a midwife. The woman keeps her house for five days,

and her husband attends her; during which he must not enter any person's house or field, nor until he and his wife have washed their clothes and bathed. On this day the child is named by the father; but, if he be not present, the mother gives a name; however, this name may be changed before the child is weaned. After this they go out as usual. The women who attended her in child-bed are entitled to a feast, are anointed with oil, and their foreheads painted red. A piece of cloth is given to the one who performed the office of a midwife; and a little grain, or some other trifling acknowledgment, to the others for their friendly assistance.

When a child dies that is not weaned, the father sends a friend to his *Maungy*, to solicit ground to bury the body; which being complied with, the corpse is carried to the grave, in a place allotted for public burial, and interred with its head to the north. For infants of this description, no further ceremony is observed; but when a child dies that has been weaned, at the expiration of five days, the relations and neighbours are invited to a feast called *Boge*, which being prepared, the father, or nearest male relation, takes a little of every thing that may be dressed, and proceeds to the road leading to the burying-ground, where he throws them away, in the name of *God* and the deceased; the intention of which is, to avert the like misfortune in future: and, returning to his house, the company are feasted, all observing the same custom of throwing away a little, in the name of *God* and the deceased, previous to eating. Another entertainment, similar to this, is given at the expiration of a year, and, annually, at the thanksgiving for reaping the *takallone* and *kosarane*. Some of each of these grains are thrown away, in the name of *God* and of the deceased.

When a child is still-born, the body is put into an earthen pot by the women who attend, and covered with leaves; the father carries the pot into the jungles, places it near the stem of a tree, and covers it with some brush-wood, where he leaves it; and there is no further ceremony.

The corpse of a person dying of the small-pox or measles, is taken with the bedstead into a jungle about a mile from the village, and placed under the shade of a tree, where the body, the bedstead, and clothes, are covered with leaves and branches, and left. Those who attend the funeral, bathe before they return to their homes. At the expiration of a year, the relations, being prepared for a festival, proceed out of the village on the road leading to where the body was placed, with all whom they invite; where one of the kinsmen having prayed, and thrown away a small portion of the feast, and made a libation in the name of the deceased, the party assembled partake of it, and return. The bodies of most others, dying a natural death, are buried; and the cause assigned for disposing of the bodies of those who die of the small-pox, as described above, is a superstitious idea, that such an act will avert any further fatality; whereas, if buried, it will continue to rage, and carry off every inhabitant of the village, which is reported to have happened formerly.

When a young man, or virgin, who is marriageable, dies, the father, or nearest relation, sends a friend to solicit four cubits of ground, to bury the deceased, from the *Maungy*; who asks if the relations propose putting the bedstead into the grave with the body; in which case a rupee is paid to him for the purchase of a hog. No time is lost in carrying the body to the burying-ground, where a grave of a foot and a half, or two feet deep, being dug north and

south, the head is placed towards the former point; the body is covered with pieces of green wood laid across it; after this some long grass, and then the earth which had been taken out, is thrown over the grass: to conclude, small stones are laid to encompass the grave, and a few over the middle of the body. No women or girls are allowed to go to funerals, nor are prayers said. On the return of the party, it is customary for the whole to wash their legs and arms previous to entering their houses.

The hog which the *Maungy* had purchased with the rupee that was paid for permission to deposit the bedstead with the corpse, is sacrificed by him. The liver being taken out and roasted, the *Maungy* takes a small bit, and casting it away with some of the blood, in the name of *God* and of the deceased, the remainder is divided among such men as may be present, who repeat what the *Maungy* had said, throwing a little away before they eat. After this repast, the carcase is divided; the *Maungy* separating a fore-quarter for his family, shares of the remainder in proportion with every inhabitant in the village. At the expiration of five days the *Boge* is observed; and every family in the village, or as many as the relations can entertain, are invited. When the father has performed the ceremony of carrying a little of every thing that is dressed, with some spirits, provided solely for the purpose of a libation, to the road leading to the burying-ground, and there cast them away in the name of *God* and of the deceased, the company assembled are all served, whether male or female, old or young, on separate leaves; and each, previous to eating, observes the ceremony of throwing some away, as already related. Another *Boge* is held at the expiration of a year, differing only from the former in the free use of liquors. At the annual thanksgiving for the reaping of the *Jakal* and *kosar*, some of each is thrown away.

in the names of the deceased kinsmen, for one or more years, according to the degree of propinquity and estimation in which each was held: it however ceases at any time that the survivors remove from the village in which their kinsmen died.

When a chief of opulence and high rank is dangerously ill, he orders his relations, male or female, and vassals, to be assembled: as soon as they attend him, he informs them of his situation; and, as they will observe he has not long to live, he desires them not to grieve, but to be comforted, and points out the son whom he wills to be his successor. Here primogeniture has no preference: if he be a son, he must succeed*, a daughter cannot; though an idiot, it is to be understood his right; and some near kinsman is named by the dying man to be his son's guardian: to him he bequeaths his territories and fortune (though certain sums or parts are to be distributed) and desires them to look to him for protection. On his death a drum is beat, to announce it to such as are at a distance, that they may attend to see the body; which is not removed before the vassals collect together, to be witnesses of the fact; it is then carried without the village, close to which it is interred on the bedstead, in the same manner as related of a young man's or virgin's funeral. A piece of silk is spread over the grave, and stones placed so as to prevent the wind blowing it off: a hut is erected to shelter it, and, round the whole, a fence of bamboos or stones. The mourners, on their return,

* In some of the *Tuppahs*, a son may be set aside, and the succession may be bequeathed to a brother, as is now the case in *Munnecurry*, the present chief, brother to the late *Maungy*, who left a son a minor, succeeded by desire of the deceased, and received his brother's widows as wives.

observe the usual oblation, and are feasted; but throw away some of whatever they have to eat or drink, in the name of *God* and of the deceased, previous to tasting it. All who come are thus treated in succession for five days, when the first *Boge* is kept; when the only difference between it and that of a *Dungaryá* or vassal, is the greater expense from a concourse of relations and adherents assembling, and that spirits are provided for them. At the festivals for reaping the *takál* and *kosar*, some of each is thrown away on the road leading to the grave, as already described. At the expiration of a year, the chief's relations and vassals being invited for their second *Boge*, the *Demauno* and the heir pray at his door for the deceased, when all assembled partake of the feast, with the usual ceremony: at the conclusion of this the fortune and goods of the deceased are divided; the heir taking one half, the other is equally divided among the sons, brothers, and nephews by the brother's side. Nephews by sisters do not share; the widows may, if the parties agree, go with any of their late husband's younger brothers, or nephews by the brother's side, as wives. If however the parties do not agree to come together, the mother of the heir has the option of remaining with her son, or of returning to her relations; the other widows must do the latter.

When a married woman dies, the widow observes the usual *Boge* at the two stated periods: he is not allowed to marry before the performance of the second, or at the expiration of a year; and it is customary to present the nearest kinsman of his deceased wife with one rupee and a turban; after which he may espouse as many wives as he pleases, or has fortune to maintain.

The body of a person who dies of a dropsy (*Narat*) is carried and thrown into a river; if buried, it is apprehended the same disorder would return, and infect and carry off the other inhabitants. The funeral party having cast the body into the water, proceed to another part of the river to bathe, and there, having brought a fowl and some *takál*, or rice, some of each is thrown into the water, in the name of *God* and of the deceased, by all who are present, before they eat. This is the only *Boge* which is observed for persons dying of a dropsy, though, at the thanksgiving for reaping the *takallone* or *kosar*, some of each is thrown away in their names.

When a person has been killed by a tiger, the body or any part of it that is found, is covered with the branches of trees. On the fifth day the relations of the deceased, with a large party, proceed to the place where the remains of their kinsman lay, taking with them a new earthen vessel, a goat, and ten or fifteen seers of *takál*, or rice. Being arrived at the spot, one of the nearest relations prays for the deceased, in which he is accompanied by the *Demauno;* at the end of their prayers, the former scatters some grains of rice, and cuts off the head of the goat, naming *God* and the deceased. The moment he severs the head, he rushes into the midst of the party, who surround him; the *Demauno* at the same time seizes the head of the goat, sucks the reeking blood, and is supposed to become frantic: he casts the head from him and springs after it, endeavouring to imitate the tiger, and making a hideous noise as like that beast as he can: he looks about for the preacher, whom it is the business of the party to conceal, and prevent his touching. Should he in his exertions accomplish this, a superstitious opinion is entertained that the poor preacher will infallibly fall a sacrifice to a tiger. When the *Demauno* is well

wearied by his pranks, the head of the goat is put under ground in the earthen vessel; this speedily restores his reason, and the preacher comes out in safety. The party thence retire to a small distance, have a feast, and return to their homes. At the expiration of a year, the second *Boge* is held for the deceased in the same manner as for any other relation, and the same attention is paid to his memory on reaping the *takallone* and *kosar*.

When any person dies of the *Moogdo*, or *Kory*, a disease in which the extremities decay and drop off, the body is buried with the usual ceremony, and the *Boge* is twice observed as usual, at which every sort of flesh, except goats, may be eaten: fish is also forbidden. In that disease goats flesh and fish are not allowed to the patient, which is the cause of their being forbidden at the *Boge*.

Such as die of an epilepsy are buried with the usual ceremonies; at their *Boge* hog's flesh is forbidden, because those who are subject to the epilepsy are not allowed to eat it.

Persons who are killed, and suicides, are buried with the usual ceremony above recited.

When a *Demauno* dies, his body is carried into the jungles and placed under the shade of a tree, where it is covered with leaves and branches, and left on the bedstead on which he died. The objection to interring his remains is a superstitious idea, that he becomes a devil, and that, if buried, he would return and destroy the inhabitants of the village; whereas by placing the body under a tree he is thus compelled to play the devil in some other. The usual *Boge* ceremonies are observed, but cow's flesh is forbidden to be eaten at them. Should a *Demauno* eat

of it. *God* in his wrath would cause all his functions to fail in their effect.

It sometimes happens that very old men, when they are very dangerously ill, desire their descendants and relations to be assembled, to whom they give directions about the disposal of their body; that is, if they wish not to be buried, some direct their remains to be placed under the shade of a tree, while others order them to be thrown into a river. Their will in this respect is strictly attended to, and the two *Boge* ceremonies are observed.

Before the chiefs of the hills put themselves under the protection of the *English* government, wrongs and injuries committed by the inhabitants of one village on that of another, were in general decided by the sword; but disputes and differences, whether with regard to property or otherwise, between inhabitants of the same town, were always settled by the *Maungy* and his officers: the first of them in rank is the *Cutwal* (who is the chief's deputy) next the *Phojedar*, and lastly the *Jemmadars*, who have a certain number of men under their authority, to inspect the conduct of the inhabitants, and report it to the *Phojedar;* to these, old and experienced men were added, and usually called in to assist, when the subject of litigation was of importance: at present, none but trifling disputes are settled by those officers; for murder and all capital crimes, the delinquents are brought to *Bhágalpore* or *Rájamahall*, to be tried by an assembly of the chiefs, agreeably to the engagements entered into by Mr. *Cleveland* with the head *Maungies*. Though the *Maungies* of all the villages also assemble on these occasions, none but the *Sirdar Maungies*, or chiefs of *Tuppahs*, and their *Naibs*, or deputies, sit in judgment. On passing sentence, it is customary for them to ask the inferior *Maungies* if

the decree be not just. Should these question it, another examination takes place, when the decision may be the same, or amended.

I have been present at several of these trials. The forms observed, were first to swear in the judges according to their faith: this being peculiar, their various ways of taking an oath may not be thought unworthy of description. The hill-word *Dabbe*, is an oath. There is no particular officer for administering oaths; any person may do it. The form in general use at these trials, is, for a mountaineer to put a little salt on the blade of a *Tulwar*, or scimitar, when he says, "if you decide contrary to your judgment, and falsely, may this salt be your death." The person swearing having repeated this imprecation, and applied it to himself, the part of the blade where the salt is, is held above his mouth, which he opens, and it is washed off into his mouth with some water, that he may swallow it. Those who, from indisposition or infirmity, do not like to swallow the salt, repeat the oath, putting their hand on two arrows fixed transversely in the ground, at about a cubit's distance, with some salt between them. On some occasions, a man swearing, repeats the oath with his hand on a sword; while others repeat it, laying hold of any person's hand: and all these forms are considered equally binding. Next, the commitment and charge are read and explained by the collector's officer in his, the collector's presence; then the delinquent must state his defence or confess his crime, sitting on his hams; after which the *Maungy* and *Phojedar* of the village where it was committed, declare what they know of it. Here the criminal is apparently his own accuser, by never deviating from truth; the vice of lying being considered an aggravation of any crime; but I have known the accused refuse to speak; for lying has not obtained

much among these highlanders. A man convicted of falsehood, or who violates a promise, is called *passiary;* the meaning of which is, a person to whom no credit is due, though he should even speak truth, and whose professions or promises are not to be depended on. Such a person is not admitted on any arbitration, or on any committee to settle trivial differences.

Formerly, when a man of one village had a claim upon an inhabitant of another, it was not uncommon, if the latter denied it, and refused to have the matter brought to trial, for the complainant to apply to the chief of his village, to unite with the heads of one or two others, to whom presents were made in proportion to the nature of the dispute, to form a junction with all their vassals to plunder the village where justice was denied, and to carry off the offender: the division of the booty was according to the rates allowed the *Maungies,* their officers, and vassals. In such troublesome times much was not taken, as all property, not of immediate use for domestic purposes, was usually concealed; the chiefs could therefore only have the first choice of the utensils and apparel which fell into their hands. The relations and chief of the village from which the captive was taken, after some time were wont to send a present to the complainant, acknowledging the demand, and promising to abide by the award which arbitrators should give, on his being released; these conditions were complied with, the prisoner was enlarged, and he and his relations had to make good the loss sustained by the inhabitants of the plundered village, as well as to pay the costs of the arbitration.

It sometimes happened on such occasions as the above, that the inhabitants of the village intended

to be plundered, got intelligence of the design, and the cause of it; on which it was usual for the *Maung* to call on his vassals, to answer the accusation: if he acknowledged it, an ambassador was dispatched to the complainant, desiring him to desist from his intention, and to name arbitrators, that justice might be done: on the other hand, if the charge was denied, and the accused exhorted his chief to stand on the defensive, with an assurance that he would either prove his innocence, after the invasion, or make good the loss sustained on both sides, the vassals were assembled and stationed to guard every avenue leading to the village. Night attacks were most common; but these precautions were in general sufficient to induce the assailants to defer a scheme which was merely to plunder, and, as long as the defendants were alert, nothing was attempted; the invaders therefore kept in their neighbourhood, and, when they were harassed by watching, the party advanced, and a man was sent forward to scatter a soporific dust to windward of the village, which, it was believed, would put every inhabitant in it to sleep in less than an hour after dark. In this persuasion they rushed on to plunder, and, carrying off all that was valuable, retreated; soon after which a deputation was sent from the despoiled village, desiring an arbitration to be appointed, to try whether the accusation was just which was alleged against the inhabitant of it: if proved, he was bound to make good the loss sustained, as well as to commute the lives that might have been lost on both sides: on the other hand, if acquitted, all this fell on the accusers.

When a man by accident killed one of his brother sportsmen in hunting, it was customary for the party to carry the body to the village; where the relations of the deceased, having declared the party had no right to slay their kinsman, set out and un-

plored the assistance of a neighbouring *Maungy* with his adherents, to obtain justice: having succeeded, they returned in force to plunder the homicide's houses, and took eatables from every house in the village: at the conclusion of this violence, the sirdars of the village assembled to sit in judgment on the part of the hunters, whilst those of the assailants met them, on the part of the kinsman of the deceased. The sentences on such occasions were seldom less than ten or twelve scores of rupees, as a commutation for the blood of the manslayer, two-thirds of which ransom he had to pay, and the remainder was recovered from the party of hunters. When the above fine was realized, another complaint was made by the relations of the deceased, to the *Maungy* of the village to which he belonged, claiming some consideration for the children which he might have begotten had he lived. Judges being appointed to examine the second demand, the fine was about two or three scores of rupees from the homicide.

When a woman had poisoned her husband, and confessed the fact, judges were appointed to settle a just retribution; ten or twelve scores of rupees were commonly adjudged, and the sum was recovered from the woman and her relations, to whom she was returned.

A person convicted of stealing cloth, was not fined more than five or six rupees, and a turban; yet the thief, by praying for an abatement of this, was in general let off, on paying one rupee, and producing one hog and a turban.

When an orphan, who had no relations or property, was convicted of stealing money, grain, or cloth, he was compelled to restore the stolen goods, and

flogged and discharged. Judges were not appointed for such a trial, as the accused was supposed neither to have property nor friends to pay the fine for him.

When grain had been stolen, and the thief unknown, the *Cherreen* was first resorted to: whether this was successful or not, the *Satane* was next tried to confirm the discovery which might have been made by the *Cherreen*, or to find the thief by it, if the *Cherreen* had been unsuccessful. In the event of both failing, or on their being firmly denied by the accused, he was compelled to attempt the *Gobereen*, which was deemed unerring. On such slender proof the accused was seized and punished, till he acknowledged the theft, and declared whether any person advised him, or was an accomplice: he was then set at liberty, and judges were appointed by the *Maungy* of the village to inquire what damage had been sustained; which the accused was obliged to make good, and to fine him according to the nature and extent of his crime. On these occasions the fines were heavy, to deter others from committing similar offences.

When a chief had killed a poor man, the officers of his own village, and those of a neighbouring village, were assembled, with some sage old men for the trial. Should the fact be established, the relations of the deceased might refuse a commutation for the blood of the murderer; in which case he was delivered up to them to be put to death, and his kinsmen had to pay the expenses of the trial. The ransom was in general ten or twelve score of rupees; but the relations of the deceased had the option of remitting the fine, and of pardoning the murderer.

All applications to a chief to apprehend any person in a civil cause, and to appoint judges for a trial, are accompanied with a fee; and any person borrowing money for that purpose, is compelled to pay two rupees for every one so borrowed, at the issue of the suit, whether he gains it or not.

A chief has no more right to strike a poor man than the latter has to strike him: the crime and punishment in either case is equal. Should a chief without provocation strike a poor man and draw blood, the latter complains to the *Cutwal*, who with the *Phojedar*, and some old men, being assembled, and having heard the complaint, they depute an agent to their chief, to require him to answer the charge: which being acknowledged, the agent returns, and informs the court that the offender confesses his crime: the complainant then demands a certain sum for reparation, and the agent sets out to the offender, who, on begging a remission of the fine, in general gets off by furnishing a hog; which being killed, the blood is sprinkled on the wounded person. A similar misfortune is thus supposed to be averted, and the parties reconciled, the aggressor paying the expenses of the trial.

Should a man borrow some *kosarane* for seed from another, and refuse to pay for eight or ten years, and till he is compelled, the lender, on establishing the loan before judges, will receive three rupees for each seer that is due to him.

The same penalty is levied from those who refuse to repay a loan of *takallone*.

Whoever accuses a man of committing incest with his mother, on proof of such abuse before a jury, he will be fined a rupee for the complainant, and a hog for a feast to the judges.

Should a man, who is sober and walking about, touch another who is asleep, or sitting, with his foot, the aggressor will be fined a rupee for the complainant, and a hog for a feast.

A person committing the same offence while drunk, is let off on giving a fowl to the complainant.

Should a man who is intoxicated, by daylight, and willingly, vomit on another, on conviction before judges, he will be fined a turban and one rupee: should he, however, from its being dark or otherwise, not see the person, he is forgiven.

Should a man seize and cultivate a field which his neighbour had begun to clear, this offence not being cognizable before judges, the latter imprecates divine wrath, that nothing may grow on it. It is believed that his prayers will be attended to, and that the produce will be small, comparatively with former years.

If two men quarrel in their cups, and blood be shed,---when sober, judges are appointed, and the person who cuts his antagonist is fined a hog or a fowl, the blood of which is sprinkled over the wounded person, to purify him, and to prevent his being possessed by a devil: the flesh of whatever has been sacrificed is eaten, and a feast reconciles the combatants; but, if the men quarrel while sober, and one be wounded, judges are appointed, and, exclusive of a hog or fowl for the purpose above described, the person who drew blood from his antagonist is fined one rupee, and a hog for the *Maungy* of the village, and, at the discretion of the judges, is compelled to pay a fine to his wounded antagonist.

Should a man, by design or accident (in carrying fire) set fire to a jungle, whatever loss is sustained by the flames spreading and burning grain, or men's property, he must make it good. If a town should be set on fire by accident, and the whole be burned, the person who accidentally caused the loss is not fined, because the loss sustained would be too great for one person or family to defray; but, if only one or two houses should be burned, the offender and family are obliged to make entire restitution.

If a man be detected by a woman sitting on her cot, and she complains of the impropriety, and demands a fowl as a forfeit, he complies; but she returns it: on the other hand, if a man detects a woman sitting on his cot, and he complains and demands a fowl, she must produce it, and he kills the fowl, sprinkling the blood on the cot to purify it: the woman is then pardoned.

Women at certain times are considered impure: should one in such a condition touch a man by accident, even with her garment, he is defiled; and for this offence she is fined a fowl, which is sacrificed, and the blood is sprinkled on the man to purify him. Women at such times may talk to men, but not touch them. A man, whose wife has that impurity, must not himself during that period sit on a chief's cot: for so doing, the fine is a fowl, and the blood is sprinkled on the cot to purify it. He must not even eat or partake of any thing at a festival during such period of separation; and any person detected in this offence, must pay the expense of purification from this pollution by another festival, to be held for that purpose at his expense.

When a party are assembled to go a hunting, and have arrived at their ground, the *Cherreen* is

held to ascertain which of the party will be most acceptable to the God of Hunting, to return thanks for the success they may have; two hens' eggs are given to the persons named. This ceremony over, some are stationed at the skirts of the wood, while others scour to drive the game to them. On their killing either a hog or a deer, the preacher breaks one of the eggs on the tooth of the animal, and throws the contents on its head, at the same time returning thanks to *Autgha*, the God of Hunting. This is observed on the death of all large game. On their return home with their game, the heads, the tails, and flesh on the inside of the loins, being separated, are considered sacred; and women are not allowed to taste of these parts; but the hunters feast on them, and the rest (one hind quarter being first given to the fortunate sportsman for his share) is equally divided among the party for their families. When the hunters have finished their repast, the one who killed the game sacrifices a fowl to *Autgha*, the blood of which is shed on the fore-teeth of the game, with thanksgiving to the God; and the preacher, having cut up the heart, that the blood of it may fall on his bow and arrow, breaks an egg on it, praying again to *Autgha*.

Should a woman privately eat of those parts of which they are forbidden to taste, the mountaineers believe that *Autgha* will be offended, and prevent their having any success in hunting on any future excursion; and, if they do not happen to kill some game, the failure is attributed to the above cause; and the *Cherreen*, or suspending a stone to a string, is resorted to, to discover the offender, who, on such doubtful proof, is fined a fowl; which, being sacrificed to *Autgha*, the God is thus supposed to be appeased, and will be propitious to them on the next hunting party.

If a hunter goes out alone, and wounds some game, and returns for assistance to find and bring it home, those who go with him are entitled to one half.

When it is found that wild boars or other game have been in a cultivated field, the owner leaves a road for the beasts to return, and erects a stage to watch their coming at night. Should he wound any, he repairs to his village to announce his success, and to beat up for volunteers to assist him in ascertaining which way the game went, that they may know where to find it in the morning. They are directed in this by the groaning of the animal, which cannot run far, the poison which they use on their arrows being of a most subtile nature; yet its being of so fatal and noxious a quality does not prevent their eating the game, after cutting out a large piece of the flesh round the arrow, which is thrown away. I heard an instance of a man's eating that part, and dying soon after. A sportsman who goes out alone, keeps half of whatever game he kills; the remainder (after the *Maungy* has taken several joints of the chine) is divided among the inhabitants of the village.

A skilful and fortunate sportsman, who gives up all his time to hunting, daily kills more or less. When ten or twelve score heads of game have fallen by his skill, it is customary for him to take all the teeth and horns to a convenient place for prayer, and to sacrifice a hog over them to *Autgha*, the God of Hunting, who sometimes favours the huntsman, by drawing some game within view of the festival, that he may sally forth to kill it; and whatever his success may be on this occasion, it is considered as an addition to his offering, and accordingly

eaten on the same altar. It is to be observed, that every sacrifice to their God is eaten.

When a hunter wounds game which he cannot find, he returns home to collect his friends to go in search of it: in the interim, should any person or persons pick it up, carry it off, and eat it,—on detection, they will be fined by the judges five rupees and as many hogs; though the complainants in general let such offenders off, on their delivering one rupee and one hog.

Dogs that will hunt are held in estimation by the mountaineers; and any person killing one is fined ten or twelve rupees.

The penalty for killing a cat is whimsical: a person guilty of it must collect all the children of the village, and distribute salt among them, that he may avert divine vengeance.

It is related that a man, sitting with another, observed his companion's clothes on fire, and that, for informing him of it, the latter demanded a fowl, to shed the blood of it on his burned clothes for his friend's officious kindness, observing also that the clothes were his; and that he had no business to say any thing about them. This practice is now obsolete as far as regards the exaction of a fowl; but the circumstance is related to this day.

Hospitality is considered as a virtue; and when a relation or man of rank comes to see his friend, he is kindly received, and treated as sumptuously as the ability of the host will admit of. Strangers travelling are well received; a house and bedding is allotted them, and the inhabitants contribute to

furnish them with as much provisions as they can eat.

When a peasant waits on his chief to represent any grievance, having made his *salam*, he is not of himself to enter on the subject of it, unless he is desired, as his chief may be then thinking of business of importance, when it would be improper and disrespectful to interrupt him; but due attention is always paid to the complainant.

A peasant does not sit in the presence of his chief without being desired to do so; and respect requires that he should decline it two or three times before he obeys, taking care to sit at a good distance. When business leads them to their chief, it is customary to have him previously advised of it. A man who has business, if he has any penetration, will observe at a distance what humour his chief is in, before he approaches him. If he should seem pleased, they think it right to embrace the moment, keeping at a respectful distance, and advancing but a step or two as desired; but if he is in an ill-humour, the complainant generally defers his suit. It is considered disrespectful in an inferior, even to enter a chief's house without being invited. When a chief visits another chief, the guest is always desired to seat himself first.

In addition to the foregoing account, a few general remarks may neither be deemed superfluous nor unnecessary. The natives of these hills are mostly very low in stature, but stout and well-proportioned. To find a man six feet high, would, I believe, be a phenomenon: there are many less than four feet ten inches, and perhaps more under five feet three inches than above that standard. It may not, however, be far from the truth to consider that as the

medium size of their men. A flat nose seems the most characteristic feature; but it is not so flat as the *Caffres* of *Africa*, nor are their lips so thick, though they are in general thicker than the inhabitants of the neighbouring plains. I shall not pretend to say whether they ought to be considered the aborigines or not, as they have no letter, figure, or hieroglyphic; all accounts of their ancestors are oral. It will however be remembered that they consider themselves descended from the eldest of the seven brothers who, according to their tradition, peopled this earth, and who was an outcast for receiving his portion of every thing eatable on an old dish; that the hills in the districts of *Bhaugulpore* and *Rájamahall* were allotted for him and his descendants: these being rather unproductive, and their wealthy neighbours refusing to associate with them, they had no alternative but that of plundering. These causes are assigned for their remaining in barbarous ignorance. In numbers, the hill-language has only words for one and two, which are variously expressed, as applied to different subjects: they however use the *Hindu* words in counting from two to twenty; and, when reckoning any thing which exceeds that quantity, they begin again at one, numbering by scores. Of their manufacture and commerce little can be said. The small and common *Hindostanu* bedsteads are made by the highlanders, and brought down for sale, with the wood-work of ploughs rudely shaped. Wood for various purposes, as well as for fire, with charcoal, and planks shaped with a hatchet (probably that they may be more portable) are also brought down for sale; to these, bamboos, cotton, honey, plantains, sweet potatoes, and occasionally small quantities of grain, may be added, and will, I believe, include all the articles, which they barter for their few wants from the plains; such as salt, tobacco, rice for the purpose of their worship,

cloth, iron heads for arrows, hatchets, crooks, and such iron implements as they may have occasion for. I may add, that they have no manufactures: except the bedsteads, there is nothing made in the hills: they are even indebted to their neighbours on the plains for earthen pots. Salt and tobacco are their principal wants; for, in describing such hill-villages as are nearest market-towns, or such as have *hauts* on the plains, it is common to say, such a hill-village is supplied with these articles by such a town on the plains. Thus their trade is confined to a very narrow compass. Cultivation is in as unimproved and rude a state as it well can be, and seldom more extensive than for the immediate consumption of the cultivator and his family. The women as well as men work in their fields. The bringing of wood and water for all domestic purposes, cooking, cleaning, arranging all house-affairs, belong to the former; and they are also employed in carrying wood, bamboos, and other things to market on the plains, to exchange for salt and tobacco. Hence it appears that the greatest share of labour falls to the women; and a man is rich in proportion to the number of his wives, who are so many labourers. There are two sorts of soil which the mountaineers cultivate, the one a black earth, which is esteemed the best; the inferior, called red, is stiff, and of the nature of clay. Where there is earth sufficient for the purpose of cultivation on the sides and tops of hills, the trees, with which these hills are well covered, are cut, leaving pretty large stumps; and such as cannot be conveniently moved, or are wanted, are burned where they fall, in the places so cleared. Holes are made from three to four inches deep, with a piece of hard wood pointed, in the middle of *June*, or setting in of the rains: in each of these, two grains of *takallone*, two of *kosarane*, two or three of *lahary*, and from five to seven of *naito*, are thrown in, when they are filled with earth. These holes are not made nearer

than a cubit and a half; if less space were left, the grain would be too thick, and not so productive.---*Koppai*, *gungarea*, *mooto*, and *koodama*, are scattered in the same field, with *massee*, which is sometimes scattered, and at others, put into separate small holes. In this field *kuldee* is also planted, and slips of the *marallee*; *bareally*, or yams, are cultivated, and grow wild likewise: *takallone*, or Indian corn, is the same as what is variously named in the plains *bootah*, *janeara*, *jewar*, *muckai*; but is larger and better on the hills, and is reaped in *November*. *Kosarane* is like the *callye* grain of the plains in taste, but is white, and rather larger: it is reaped at the latter end of *November* and beginning of *December*; *lahary* is a large pea, reaped in *December*; *naito* is a round seed, reaped in *December*; *koppai* is cotton, and does not flower before the third year, when it is gathered in *March*, *April*, and *May*, and sells for as much as cotton produced in the plains; *gungarea* is a grain smaller than the *cheennee* of the plains, and is reaped in *September* and *October*; *mooto* is somewhat like the *gungarea*, and reaped at the same time; *koodama* is also very small grain, and reaped as the two former; *mossee* is the same as the *bhattmoss* of the plains, but a smaller grain, and is reaped in *September* and *October*; *kuldee* is a large plantain, bears some fruit the second year, but more plentifully the third and fourth, after which it declines; *marallee* is the same as the *sakkerkund*, or sweet potatoe of the plains, but much larger, is taken out of the ground in *November*, *December*, and *January*. The foregoing includes all the cultivated productions of the hills: they are, as may be supposed, of a hardy nature, and are plentiful or scanty in proportion to their having enough or too little rain, for they trust entirely to the monsoon for water, having neither reservoirs, nor any method of watering their fields; which in fact might not be possible from their situation. This last season their crops in general failed,

from want of rain: on these occasions, the mountaineers cut more wood and bamboos, and make greater quantities of charcoal, for which they find a ready mart in the lowlands, and exchange it for grain.—From this resource, and the thriftiness of some among themselves, who are provident, they averted a famine during the great scarcity in 1769 and 1770: many of the inhabitants of the plains retired to the hills, where they got a subsistence; but having associated and mixed with the highlanders, they of course lost their casts, and therefore many remained with them. The *takallone* is the most productive of any of their grain, and is their chief subsistence. There are no esculent herbs nor garden-stuff on the hills. *Pungdoallee*, the same as *sootnee* in the lowlands, grows wild, and is larger than the *sootnee*. In times of scarcity, *singlah* (in *Moors. Jingoor*) is found in the jungles; but it must be boiled in several waters, or well roasted, and is a dangerous unwholesome food: of much the same nature is *kindallee*, which is sliced thin and boiled in sour waters, otherwise it is poisonous. The *mango*-tree, *tamarind*, *kuthul*, *bale*, *burrel*, *bayer*, *mowwah*, *jamon*, *phulsah*, *dwarf cudjoor*, that yields a kind of date, and *keand*, with others peculiar to the hills, grow wild. Their domestic animals are hogs, goats, and fowls; they have also some dogs and cats; the wild animals are in general the same that are met with in the plains, except a species of large deer, and another remarkably small; the former are called *mauk*, and the latter *illarroo*.

The internal government of the hills, or the connection between the *Maungy* and his *Dungarear* (adherents) is a simple engagement for mutual protection. The *Maungy* swears to do them justice in disputes among themselves, and not to suffer them to be oppressed by others; and they, on their part, swear fidelity to him as long as he shall protect them and

do them justice: a failure on either part dissolves the contract: in fine, the *Maungy* is no more than a *primus inter pares*. The *Dungarear* apply to him for land to cultivate, and he allots it: when the crops are ripe, the *Cutwal* and *Phojedar*, on the part of the *Maungy*, prepare with the proprietor of each field to estimate what portion he can afford to give his *Maungy:* thus an easy and amicable contribution is levied by the consent of the cultivator, who has no fixed proportion to yield to his chief. If the crops be luxuriant, he willingly gives what he can spare; if scanty, very little is demanded; if obstinately refused (a case which seldom or never happens) the *Maungy* cannot forcibly take any part: but, as a punishment, he can prevent this refractory *Dungarear* from cultivating in his territory again. The *Cutwal* and *Phojedar* receive a little grain for their trouble, or perhaps the *Maungy* remits their contribution; for these officers, as well as the *Maungy* himself, cultivate their fields: they have no salary; their stations perhaps give them some degree of consequence; and on all trials they either receive some compensation, or are feasted; the latter however, from their disputes in general being trivial, is most common. The appointment of *Cutwals*, *Phojedars*, and *Jemmadars*, belong to the *Maungies*; and he can dismiss from office when any of them offend: the *Jemmadar* is merely an honorary officer. I cannot now learn at what period the hill-villages were formed into *Tuppahs*. It seems however to have been an association for mutual protection; for the *Sirdar Maungy*, or chief of a *Tuppah*, receives no contribution from any village but his own, or one in which he resides: when appealed to, or applied to for justice, he is paid in proportion to the amount or magnitude of the cause. He could assemble the several *Maungies* with their adherents on any offensive or defensive operations, but could not compel those to act who

disapproved of the motives. In their wars, when highlanders were made prisoners, they were either set at liberty, or were ransomed. In their descents into the plains they were not however so merciful: all who opposed them were put to death; those who made no defence, women and children, were stripped of such valuables as they might have, but neither punished nor made prisoners. On such occasions, the chastity of women was held inviolable; for it was believed, if any of the assailants committed violence on the persons of females, that he would infallibly lose his reason and die. The bow and arrow is the only arms peculiar to these mountaineers; some few have swords, and still fewer have match-locks; but these, probably, were collected in their predatory incursions into the plains, either in war or hunting. In general, they use the bow and arrow in the former, but always in the latter, though I do not think they are expert archers, when it is considered they are all hunters from the time they can carry these arms; and are so fond of that diversion, that they go out at all seasons, and undergo great fatigue for the gratification which it affords them. A poisoned arrow is always used in hunting, but never in war, though they generally had them, as it is said, to be prepared for any game that might start.

There are no slaves on the hills; slavery can neither be said to have been tolerated nor forbidden. Parents never sell their children: and those who hire themselves as servants, stay no longer than they agree with or like their masters.

Enough may have been said of their modes of worship: they are not the first race of people who, we are taught, believed that the chief means of pleasing the Gods, and of pacifying them when they were angry, consisted in certain ceremonies, sacri-

fices, and feasts, in the due observance of which they conceive their welfare depends; for, in praying, the suppliant says little more than to recommend himself and family to the Supreme Being and subordinate deities, and to promise oblations at the shrine of the God he then worships, provided he is fortunate, and enabled so to do by his prosperity. Their expiatory sacrifices are however confined to the brute creation; there is no instance of their offering up any of the human species to appease the Gods, who are supposed to be abundantly pleased by the votaries feasting as large congregations of men as they can afford to maintain; for, in proportion to the expense in meat and spirituous drink, the piety of the votary is measured. The part which the *Demauno*, their oracle, "dreamer of dreams," bears in their ceremonies and forms of worship, has already been described. Before a man vows to sacrifice at any shrine, he consults the *Cherreen* and *Satane:* when these agree, he repairs to the *Demauno*, without informing him of the result of those two processes, but explains to him the cause of waiting on him: the *Demauno* is allowed one, two, and even three nights to confer with the Deity in a vision, to prescribe what the suppliant ought to do; and, as it is believed he has familiar intercourse with God in his dreams, his decrees are obeyed, though, when they differ from what was discovered by the *Cherreen* and *Satane*, these are held over again to reconcile them. The women neither offer sacrifices, nor approach the shrines of their Gods; even husbands are forbidden to partake of festivals during the separation of their wives. These prohibitory laws regarding women are of an old date, and their origin perhaps not well known.

Colonel *Brown*, in his account of these hills, forwarded to government in 1779, observes, that it was

about fifteen years since the hill-people had any government among themselves of a general nature; during which period they had become dangerous and troublesome to the low country; that their ravages had been the more violent, as they were stimulated by hatred against the *Zemindars*, for having cut off several of their chiefs by treachery. The Colonel might have added, that, during that interregnum or dissolution of government, it was a common practice for the *Zemindars* on the skirts of the hills to invite the chiefs in their vicinity, with their adherents, to descend and plunder the neighbouring *Zemindaries*; for which, and for the passage through their lands, the mountaineers divided the booty with them. Thus, at one time, from repeated acts of treachery in the *Zemindars*, the mountaineers were provoked to take ample vengeance on them, and their unhappy Ryots; and at other times from their engaging the chiefs to make predatory incursions, to which they were strongly incited, no less from a desire of plundering their more opulent neighbours, than from the difficulty of obtaining salt and tobacco from the *hauts*, all friendly intercourse was at a stand; the low country bordering on the hills was almost depopulated, and travellers could not pass with safety between *Bhaugulpore* and *Furruckabad*, nor could boats, without danger of being plundered, put to for the night on the south side of the *Ganges* between the before-named places. It was at this period of double treachery on the part of the *Zemindars*, and predatory hostilities on the part of the mountaineers (from which it may not be a strained inference, that the machinations of the former were in a great measure the cause of that necessity which compelled the latter to such frequent and fatal descents, when these public and private incendiaries were making large strides in ruining these once fertile districts) that Captain *Brooke* was stationed with a corps of light infan-

try, to avert their utter destruction. On this duty it is well known that he acquitted himself with great credit, from his uncommon exertions and success in pursuing the unfortunate mountaineers unto their hills, where numbers must have unavoidably fallen; for it became unquestionably necessary to impress them with a dreadful awe of our prowess: and in this harassing and unpleasant warfare, I have been well informed by officers who were with Captain *Brooke*, that his gallant conduct could not be too much commended. He made them sensible of the inefficacy of opposing him in the field, and invited the chiefs to wait upon him, and negociate; when he gave a feast to those who came, and made them presents of turbans; but before any permanent establishment took place, he was succeeded in the command of the light infantry by Captain *Browne*, who made further progress in conciliating the minds of the discomfited mountaineers. He placed them on the road from *Furruckabad*, near *Colgong*, to protect the *Dwarks*, on which duty they still continue. From this and other measures of his, Captain *Brooke* and he, it will be allowed, laid the foundation for the most permanent and happy settlement concluded with the hill-chiefs by the late Mr. *Augustus Cleveland*, that could possibly be attained. He was sensible, from the rapine and decay of these districts, that the peaceable deportment of the mountaineers ought to be purchased; and, while he was reconciling them to become subjects to the *British* government, he bestowed liberal presents in money and clothes to the chiefs, and to all the men and women who came down to him. Of his generosity, they speak with gratitude: and for the blessings and benefit which they derive from the wise and judicious conditions which he granted, and which were confirmed by government, I hope they will ever have reason to be thankful. As long as that govern-

ment lasts, the comforts and happiness which they derive from them, must ever insure their obedience. To engage their confidence, Mr. *Cleveland*, in the early part of his intercourse with the mountaineers, entertained all who offered their services as archers, and appointed many of the relations of the chiefs as officers: they were not (nor are they as rangers, though they very seldom now ask their discharges) bound to serve for any limited time; the corps, of course, constantly fluctuated, and was frequently, I understand, above a thousand strong. He clothed them; and in less than two years after they were formed, from the confidence he had in their attachment and fidelity, obtained fire-arms for them; in the use of which, I may venture to observe, that they are expert, and have address; and I can also without hesitation assert, that they are capable of as high a degree of discipline as any native corps in the service; and I trust I shall have the happiness to prove this in due time. Exclusive of having thus employed so many of the mountaineers, Mr. *Cleveland* fixed the salary of ten rupees per month for each chief of a *Tuppah*, three rupees ditto for each of his *Naibs*, and two for the *Maungy* of each village, from which there shall be a man enrolled in the hill-rangers; but from such as supply not a man, the inferior *Maungy* receives no monthly allowance. In consideration of these establishments, I understand, the chiefs are not only responsible for the peaceable deportment of their own adherents, but bound to deliver over all delinquents and disturbers of the public peace within their own limits to the collector, to be tried by an assembly of the chiefs, either at *Bhaugulpore* or *Rájamahall*, as already related. It has ever been customary, on these occasions, to feast the chiefs so assembled. When any report is to be made to the collector, it is the duty of a *Naib* to wait on him with it, should the chief be indisposed, or otherwise prevented.

From these happy and admirable arrangements, digested by Mr. *Cleveland*, whose name ought to be dear both to the natives of the hills and lowlands, the ease, comfort, and happiness of the former is insured (for which they are grateful, and speak of him with reverential sorrow) and peace and safety secured to the latter; and if they have any goodness, they ought not to be less thankful. These solid and essential benefits are attended comparatively with but a trivial expense, and must ultimately be an advantage to government. I have been led to say more on this subject than I intended; yet it may not be thought foreign to it to add, that the *Aumlah* and *Zemindars* erected a monument to the memory of Mr. *Cleveland*, nearly in the form of a pagoda, and that another was also erected at the expense of government, by the order of the Honourable the Governor General and Council; on which is the following inscription:

To the memory of AUGUSTUS CLEVELAND, Esq.
Late collector of the districts of *Bhaugulpore* and *Rájamahall*,
Who, without bloodshed or the terrors of authority,
Employing only the means of conciliation, confidence, and benevolence,
Attempted and accomplished
The entire subjection of the lawless and savage inhabitants of the jungleterry of *Rájamahall*,
Who had long infested the neighbouring lands by their predatory incursions,
Inspired them with a taste for the arts of civilized life,
And attached them to the *British* Government by a conquest over their minds:
The most permanent, as the most rational, mode of dominion.
The Governor General and Council of *Bengal*,
In honour of his character, and for an example to others,
Have ordered this Monument to be erected.
He departed this life on the 13th day of *January*, 1784, aged 29.

Before I conclude, I must do the mountaineers the justice to mention, that they have as great a regard for truth as any people on earth, and will sooner die than deliberately tell a falsehood. In this I must confine myself to those who have not associ-

ated or mixed in conversation with their neighbours, the *Hindu* and *Mussulman* of the plains: where it is well known, *lie* and *interest* are synonimous terms: and what change in this respect a more familiar intercourse will occasion, I shall not pretend to premise.

They are in general of a cheerful disposition, and humane: both men and women are remarkably bashful. When asked to sing (their notes are wild and drawling, having a slow cadence, from forte to piano) or dance, they ever answer, that they can do neither without drinking freely, for they are ashamed until they are intoxicated. Like all people in so rude and uncultivated a state, they are passionately fond of spirituous liquors, and, I am inclined to believe, prefer that which from its strength will inebriate them the soonest. Hence it appears that they are not ashamed of being drunk, and in fact their religion promotes it, for a festival would not be much esteemed that was unattended with a hearty carouse.

I conceive, instances of remarkable longevity are very rare: I have heard of one man who was said to be more than five score; but, as I have never met with any of them that appeared so old, or that could tell his age, for they keep no account of it, I am inclined to doubt the fact. In a late excursion with Mr. *Grant* into the hills, we saw an old woman, who was said to be of a great age: she was a relation to a chief, whose house we were at; and having taken a cheerful glass, with his wives and daughter, of liquors which Mr. *Grant* had carried up to give them, she set him the example of singing and dancing to us; in which she was followed by the chief and two of his youngest wives, who were at the time far from sober. When we had dined, the meat that remained was given to them; of which, the family being assembled, they thankfully partook, and

made indubitably a more luxurious meal than they ever had before. We took a route in which no *European* had been; and Mr. *Grant*, to reconcile them to so novel a sight, as well as to conciliate their attachment, carried up a variety of presents of clothes, beads, and looking-glasses, which he distributed with money to every family in all the villages we passed, and thus left them the most acceptable memorials of their visitors.

Bhaugulpore, June 27, 1792.

ADDITIONAL REMARKS

ON THE

SPIKENARD OF THE ANCIENTS.

BY THE PRESIDENT.

NEARLY at the time when the result of my first inquiries concerning spikenard was published in the second volume of our *Asiatic Researches*, there appeared in the *Philosophical Transactions* an account of the *Andropogon Jwarancusa*, the specimen of which Dr. *Blane* had received from *Lucknow*, and which he supposes to be the true *Indick* nard of *Dioscorides* and *Galen*. Having more than once read his arguments with pleasure, but not with conviction, I feel it incumbent on me to state my reasons for dissenting from the learned physician with all the freedom of a searcher for truth, but without any diminution of that respect to which his knowledge and candor justly entitle him.

In the first place, there is a passage in Dr. *Blane's* paper, which I could not but read with surprise; not because it is erroneous or disputable (for nothing can be more certain) but because it is decisive against the very proposition which the writer

endeavours to support. "*Dioscorides* mentions the "*Syriack* nard," says the Doctor, "as a species dif-"ferent from the *Indian*, which *was certainly brought* "*from some of the remote parts of India*; for both he "and *Galen*, by way of fixing more precisely the "country whence it came, call it also *Gangites*." We may add, that *Ptolemy*, who, though not a professed naturalist, had opportunities in *Egypt* of conversing with *Indian* merchants on every thing remarkable in this country, distinguishes *Rangantati* as producing the true spikenard; and it is from the borders of that very district, if we believe modern *Indians*, that the people of *Butan* bring it yearly into Bengal*. Now, it is not contended that the new species of *Andropogon* (if it be a new species) *may be* the *Indick* nard of *Dioscorides*†, because it was found by Mr. *Blane* in a remote part of *India* (for that solitary fact would have proved nothing); but it is learnedly and elaborately urged, that it *must be* the true *Indian* spikenard, because it differs only in the length of the stalks from the nard of *Garcias*; which, according to him, is the only species of *nardus* exported from *India*, and which resembles a dried specimen seen by *Rumphius*, and brought, he says, among other countries, from *Macrán*, or the ancient *Gadrosia*; the very country where, according to *Arrian*, the true nard grew in abundance: for "the *Phenicians*," he says, "collected "a plentiful store of it; and so much of it was tram-"pled under foot by the army, that a strong per-"fume was diffused on all sides of them." Now

* *Ptolémée* distingue le canton de *Rhandamarcotta*, en ce qu'il fournit la plante, que nous appellons *Spicnard* ce qui peut convenir à *Rangamati*; et des differentes espéces, l'*Indique* est bien la plus estimée. *D'Anv. Antiq. Geogr. Ind.* 81.

† Dr. *Roxburgh*, with great reason, supposes it to be the *Muricated Andropogon* of *Koenig*, who mentions the roots as odoriferous when sprinkled with water. See *Retz.* iii. *Fascic.* 43 and v. 21.

there is a singular coincidence of circumstances; for our *Andropogon* was discovered by the scent of its roots, when they were crushed by the horses and elephants in a hunting party of the *Vazir Asufuddaulah*; so that, on the whole, *it must be the same with the plant mentioned by Arrian:* but it may be argued, I think, more conclusively, that a plant, growing with great luxuriance in *Gadrosia*, or *Macrán*, which the Doctor admits to be *a maritime province* of *Persia*, could not possibly be the same with a plant *confined to remote parts of India;* so that, if *Garcias*, *Rumphius*, and *Arrian* be supposed to have meant the same species of nard, it was evidently different from that of *Dioscorides* and *Galen*. The respectable writer, with whose opinions I make so free, but from no other motive than a love of truth, seems aware of a little geographical difficulty from the western position of *Macrán;* for he first makes it extend to the river *Indus*, and then infers, from the long march westward and the distress of Alexander's army, subsequent to the discovery of the spikenard, that it must have grown in the more eastern part of the desert, and consequently on the very borders of *India;* but, even if we allow *Gadrosia*, or *Gadrosis*, to have been the same track of land with *Macrán* (though the limits of all the provinces in *Persia* have been considerably changed) yet the frontier of *India* could never with any propriety be carried so far to the west; for not only the *Oritæ* and *Arabitæ*, but, according to *Mela*, the whole province of *Ariana* were between *Gadrosis* and the *Indus;* and, though *Macrán* (for so the word should be written) may have been annexed to *India* by such whimsical geographers as the *Turks*, who give the name of *White Indians* to the *Persians* of *Arachosia*, and of *Yellow Indians* to the *Arabs* of *Yemen*, yet the river *Indus*, with the countries of *Sind* and *Múltan* on both sides of it, has ever been considered by the *Persians* and *Arabs* as the western limits of *Hind* or *India;*

and *Arrian* himself expressly names the *Indus* as its known boundary. Let *Gadrosis*, however, be *Macrán*, and let *Macrán* be an Indian province, yet it never could have been *a remote part of India* in respect of *Europe* or *Egypt*, and, consequently, was not meant by *Galen* or *Dioscorides*, when they described the true spikenard. It must be admitted, that, if the *Siree* of *Rumphius*, which differs little from the *nardus* of *Garcias*, which corresponds for the most part with the new *Andropogon*, was ever brought from the province of *Macrán*, they were all three probably the same plant with the nard of *Arrian*: but, unfortunately, *Rumphius* thought of no country less than of *Persia*, and of no province less than of *Macrán*; for he writes very distinctly, both in his *Latin* and his *Dutch* columns, that the plant in question grows in *Mackián*, which he well knew to be one of the *Moluccas**. I am far from intending to give pain, by detecting this trifling mistake; and, as I may have made many of greater consequence, I shall be truly obliged to any man who will set me right with good manners, the sacred laws of which ought never to be violated in a literary debate, except when some petulant aggressor has forfeited all claim to respect.

Arrian himself can by no means be understood to assert that the *Indian* spikenard grew in *Persia*; for his words are *a fragrant root of nard*†, where the omission of the definite articles implies rather *a nard*, than *the nard*, or the most celebrated species of it; and it seems very clear, that the *Greeks* used that foreign word generically for odoriferous plants of dif-

* Hi flores sæpe, immo vulgo fere, observantur in vetustis *Siree* stipitibus, qui in *Ternata*, *Motira*, et *Mackian* crescunt. Vol. 5. Lib. 8. Cap. 24. p. 182.

† Νάρδου ῥίζαν εὐοσμον.

ferent natural orders: but *Arrian* in truth was a mere compiler; and his credit, even as a civil historian, seems liable to so much doubt, that it cannot be safe to rely on him for any fact in the history of nature. "We cannot," says the judicious and accurate *Strabo*, "give easy credence to the generality "even of cotemporary writers concerning *Alexander*, "whose fame was astonishingly high, and whose his- "torians, preferring wonders to truth, wrote with se- "cure negligence; well knowing, that, as the far- "thest limits of *Asia* were the scene of his actions, "their assertions could hardly be disproved." Now *Arrian's* principal authority was *Aristobulus* of *Cassandra*, whose writings were little prized by the ancients, and who not only asserted "that *Gadrosis* produced "very tall *myrrh*-trees, with the gum of which the "*Phenicians* loaded many beasts" (notwithstanding the slaughter of them, from the distress of the whole army) but, with the fancy of a poet describing the nest of a phœnix, placed *myrrh*, *incense*, and *cassia*, with *cinnamon*, and *spikenard* itself, even in the wilds of *Arabia*.—"The fruitfulness of *Arabia*," says *Arrian*, "tempted the king of *Macedon* to form a design of "invading it; for he had been assured that myrrh and "frankincense were collected from the trees of that "country; that *cinnamon* was procured from one of "its shrubs; and that its meadows produced sponta- "neously *abundance of spikenard*." *Herodotus*, indeed, had heard of cinnamon in *Arabia*, where the *laurus*, to the bark of which we now give that name, was, I verily believe, never seen: even the myrrh-tree does not seem to have been a native of *Arabia*; and the public are now informed that it was transplanted from *Abyssinian* forests, and has not flourished on the opposite shore; but, whatever be the countries of myrrh and cinnamon, we may be certain that any learned *Arab* would laugh at us, if we were to tell him that the *Sumbulu'l Hind* grew wild.

in abundance on the plains of *Tahâmah*. It seems a bold allegation of *Garcias*, that he has exhibited "the only species of *nardus* known in *India*, either "for consumption by the natives, or for exportation "to *Persia* and *Arabia*." If he meant that any plant was either used in this country or exported from it by *the name of nard*, he had been strangely deceived; and if he meant, that it was the only fragrant grass used here as a medicine, or as a perfume, his error was yet more gross. But, whatever his meaning might have been, if the nard of *Garcias* and of *Arrian* was one and the same plant, it is wonderful that it ever should have been exported to *Persia* and *Arabia*, where it grew, we are told, in so great abundance. The nard of *Arabia* was, probably, the *Andropogon Schœnanthus*, which is a native of that country: but, even if we suppose that the spike-nard of *India* was a *reed* or a *grass*, we shall never be able to distinguish it among the many *Indian* species of *Cyperus*, *Andropogon*, *Schœnus*, *Carex*, and other genera of those natural orders, which here form a *wilderness of sweets*; and some of which have not only *fragrant roots*, but even *spikes* to the ancient and modern senses of that emphatical word; one of them, which I never have seen in blosom, but suppose from its appearance to be a *Scœnus*, is even called *Gónarda*, and its dry root has a most agreeable odour; another, which *Rheede* names *Bálaca*, or *Ramacciam*, or *White Iriveli*, and which *Burman* thought a variety of the *Schœnanthus*, is a considerable article, it seems, of *Indian* commerce, and therefore, cultivated with diligence, but less esteemed than the *black* sort, or *Carabála*, which *has a more fragrant root, and affords an extremely odoriferous oil**. All those plants would,

* 12 Hort. Malab. tab. 12 and 9 H. M. p. 145. See also the *Flora Indica*, and a note from *Herman* on the valuable oil of *peree*.

perhaps, have been called *nards* by the ancients; and all of them have stronger pretensions to the appellation of *the true spikenard*, than the *Febrifuge Andropogon*, which the *Hindus* of *Behár* do not use as a perfume. After all, it is assuming a fact without proof, to assert that *Indian* spikenard was evidently gramineous; and, surely, that fact is not proved by the word *arista*, which is conceived to be of a *Grecian* origin, though never applied in the same sense by the *Greeks* themselves, who perfectly well knew what was *best* for mankind in the vegetable system, and for what gift they adored the goddess of *Eleusis*. The *Roman* poets (and poets only cited by Dr. *Blane*, though naturalists also are mentioned) were fond of the word *arista*, because it was very convenient at the close of an hexameter, where we generally, if not constantly, find it; as *Homer* declares in *Lucian*, that he began his *Iliad* with Μῆνιν, because it was the first commodious word that presented itself, and is introduced laughing at a profound critic, who discovered in that single word an epitome of the whole poem on the *wrath* of *Achilles*. Such poets as *Ovid* and *Lactantius*, described plants which they never had seen, as they described the nest of the phœnix, which never existed, from their fancy alone; and their descriptions ought not seriously to be adduced as authorities on a question merely botanical; but, if all the naturalists of *Greece* and *Italy* had concurred in assuring us that the nard of *India* bore an ear or spike, without naming the source of their own information, they would have deserved no credit whatever; because not one of them pretends to have seen the fresh plant; and they have not even agreed among themselves, whether its virtues resided in the *root*, or in the *husky leaves* and stalks that were united with it. *Pietro della Valle*, the most learned and accomplished of eastern travellers, does not seem to have known the *Indian* spikenard, though

he mentions it more than once by the obsolete name of *Spigonardo;* but he introduces a *Sumbul* from *Khatá*, or a part of *China*, which he had seen dry, and endeavours to account for the *Arabic* name in the following manner;—" Since the *Khatáian Sum-*
" *bul*," says he, " is not a *spike*, but a *root*, it was
" probably so named, because the word *Sumbul* may
" signify, in a large acceptation, not only the spike,
" but *the whole plant*, whatever *herb or grass* may be
" sown; as the *Arabic* dictionary*, entitled *Kámús*,
" appears to indicate." The passage to which he alludes is thus:—" *Sumbul*," says the author of the *Kámús*, " is an *odoriferous plant*, the strongest of
" which is the *Súrì*, and the weakest the *Hindi;*
" but the *Sumbul* of *Rúm* has the name of *nardin*."
I suggested in my former paper, and shall repeat in this, that the *Indian* spikenard, as it is gathered for use, is in fact *the whole plant;* but there is a better reason why the name *Sumbul* has been applied to it. By the way, *Della Valle* sailed, as he tells, along the coast of *Macrán*, which he too supposes to have been a part of *Gadrosia;* but he never had heard that it produced *Indian* spikenard, though the *Persians* were fully acquainted with that province; for he would not have omitted so curious a fact in his correspondence with a learned physician of *Naples*, for whose sake he was particularly inquisitive concerning the drugs of *Asia*. It is much to be wished, that he had been induced to make a short excursion into the plains of *Macrán*, where he might have found, that the wonderful tree which *Arrian* places in them, *with flowers like violets, and with thorns of such force and*

* Giacchè il *Sombol* del *Catai* é radice e non è *Spiga*, potremmo dire, che cosi si chiami, perchè forse la parola *Sombol* possa pur largamente significare non solo la spiga, ma *tutta la pianta* di ogni erba ò biada, che si semini; come par, che il *Camùs*, vocabolario *Arabico*, ne dia Indizio. *Lett.* 18 di *Baghdad*.

magnitude, as to keep wild beasts in captivity, and to transfix men on horseback who rode by them incautiously, was no more, probably, than a *Mimosa*, the blossoms of which resembled violets in nothing but in having an agreeable scent.

Let us return to the *Arabs*, by whom *Dioscorides* was translated with assistance (which the wealth of a great prince will always purchase) from learned *Greeks*, and who know the *Indian* spikenard better than any *European*, by the name of *Sumbulu'l Hind*. It is no wonder that they represent it as weaker in scent and in power than the *Sumbul* of the *Lower Asia*, which, unless my smell be uncommonly defective, is a strong *Valerian*; especially as they could only have used the dry nard of *India*, which loses much of its odour between *Ranpúr* and *Calcutta*. One question only remains (if it be a question) whether the *Sumbulu'l Hind* be the true *Indian* spikenard? for in that case, we know the plant to be of the natural order, which *Linnæus* calls *aggregate*. Since the publication of my paper on this subject, I put a fair and plain question severally to three or four *Mussulman* physicians: "What is the *Indian* name of the plant which the "*Arabs* call *Sumbulu'l Hind?*" They all answered, but some with more readiness than others, *Játámansí*. After a pretty long interval, I shewed them the *spikes* (as they are called) of *Játámansí*, and asked, what was the *Arabic* name of *that* Indian *drug?* They all answered readily, *Sumbulu'l Hind*. The same evidence may be obtained in this country by any other *European* who seeks it; and if among twelve native physicians, versed in *Arabian* and *Indian* philology, a single man should, after due consideration, give different answers, I will cheerfully submit to the *Roman* judgment of *non liquet;* my own inquiries having convinced me, that the *Indian* spikenard of *Dioscorides* is the *Sumbulu'l Hind;* and that the *Sumbulu'l Hind*

is the *Jatámánsí* of *Amarsính*. I am persuaded, that the true nard is a species of *Valerian*, produced in the *most remote* and hilly parts of *India*; such as *Népál*, *Morang*, and *Butan*, near which *Ptolemy* fixes its native soil. The commercial agents of the *Dévarája* call it also *Pampí*; and, by their account, the dried specimens which look like the tails of ermines, *rise from the ground, resembling ears of green wheat, both in form and colour*: a fact which perfectly accounts for the names *Stachys*, *Spica*, *Sumbul*, and *Khúshah*, which *Greeks*, *Romans*, *Arabs*, and *Persians* have given to the drug, though it is not properly a *spike*, and not merely a *root*, but *the whole plant*, which the natives gather for sale, before the radical leaves, of which the fibres only remain after a few months, have unfolded themselves from the base of the stem. It is used, say the *Butan* agents, as a perfume, and in medicinal unguents, but with other fragrant substances, the scent and power of which it is thought to increase: as a medicine, they add, it is principally esteemed for complaints in the bowels. Though considerable quantities of *Jatámánsí* are brought in the caravans from *Butan*, yet the living plants, by a law of the country, cannot be exported without a license from the sovereign; and the late Mr. *Purling*, on receiving this intelligence, obligingly wrote, for my satisfaction, to the *Dévarája*, requesting him to send eight or ten of the plants to *Ranpúr*: ten were accordingly sent in pots from *Tasisúdan*, with as many of the natives to take care of them, under a chief, who brought a written answer from the *Rájá* of *Butan*; but that prince made a great merit of having complied with such a request; and my friend had the trouble of entertaining the messenger and his train for several weeks in his own house, which they seem to have left with reluctance. An account of this transaction was contained in one of the last letters

that Mr. *Purling* lived to write; but, as all the plants withered before they could reach *Calcutta*, and as inquiries of greater importance engaged all my time, there was an end of my endeavours to procure the fresh *Jatámánsí*, though not of my conviction, that it is *the true nard of the ancients.*

ON THE

DHANE'SA, OR INDIAN BUCEROS.

BY LIEUT. CHARLES WHITE.

COMMUNICATED BY LIEUT. FRASER.

THERE are two distinct species of this bird; one called *Bægma Dunnase*, and the other *Putteal Dunnase*.

I shall first treat of the *Bægma*, which is divided into two kinds; the specific marks of which I shall hereafter mention.

The *Bægma Dunnase* is a very remarkable bird, and, I believe, has not hitherto been described. As far as lies in my power, I shall endeavour to rescue it from a situation so unworthy the distinction it has a strong claim to, among the curious productions of nature.

It may be necessary to premise, that the names of *black-horned* and *white-horned* are given by myself, the natives not making any distinction between them. I have bestowed upon them these names from the difference of the bases of their horns.

Black-horned, Bægma Dunnase, with a large double beak, or a large beak surmounted by a horn shaped

like the upper mandible, which gives it the appearance of a double beak. The horn is hollow; at the base brown, with a broad edging of *black*, quite hard; a black mark runs from about one inch from the base to the point of the horn, very irregular in its breadth, in the centre reaches to the junction of the horn with the upper mandible; upper and lower mandible serrated, and separate from each other about three inches in the middle of the beak longitudinally; upper mandible marked with black at its junction with the head, which part is quite hard; immediately below this the lower mandible has a large black mark, which appears on both sides, and joins at the bottom; joining to this, and covering the base of the lower mandible, is about an inch of white shrivelled skin; between these, at the edge of the mandible, is a small brown spot covered slightly with feathers; the rest of the beak and horn cream-colour, patched with yellow, except the point, which is much whiter; the nostril placed at a small distance from the head, in the junction of the horn with the beak: head, neck, back, and coverts of the tail, black; breast, belly, thighs, and coverts of the vent, white; scapulas, greater and lesser coverts of the wings, black, varying to a greenish tinge; under coverts of the wings, white; primaries, white at their base, then black, with three inches of white at their ends; secondaries, nearly the same; tertials black; a few white feathers on the outward edge of the wing, just below the shoulder; tail cuneiform, two middle feathers black, longer than the rest, which are white, four on each side crested, close; the feathers extending a little way down the neck; [illegible] speculum black, irides reddish brown; the [illegible]k immediately round the eye, and extending [illegible] the beak to the ear, devoid of feathers, consisting of a shrivelled skin, which is nearly black; [illegible] feathers about an inch long, extending partly

across the head; tongue short, formed like a dart, with the ears of the barb raised above the shaft; near the epiglottis it swells to the size of a small nutmeg, which part is perforated; when the mouth is open, a black and brown knob appears below the upper mandible, rising from its base to an inch beyond its apparent junction with the head; legs and feet black, tinged with brown and dirty white; claws large and strong, three in front, and one behind; length, upon an average, from the forehead to the tip of the tail, two feet eight inches; extent, three feet two inches.

White-horned Bægma Dunnase, agreeing with the former in description, except in the following particulars: the horn in these is generally smaller, and blunter at the point, and at the base it is soft, consisting of a membraneous substance; the ground white, marked with crimson; the skin, which covers the base of the lower mandible, is very differently shaped, and is much stained with crimson; only a small spot of black upon the upper mandible, where it joins the head, which junction is soft; eye black, the skin round the eye, extending to the ear, white, marked with crimson: the ear-feathers form a curve, beginning in the centre of the black mark of the lower mandible, running along it, and rising above the ear, where it joins the crest. In some I have observed the white tail-feathers marked in the web with black at their base. These birds in size are rather smaller than the first.

Putteal Dunnase, with a double beak, or horn, upon the upper mandible, over which it curves about half way, base hid in feathers; horn black, except at the lower edge, near the point, which is brown; the upper mandible black in the middle, shaded off to white at the point; lower mandible the same, white

at the bottom, both serrated; a small black projection from the bottom of the lower mandible crested, cinereous, tinged with brown; the feathers, from the eye to an inch over the beak, iron-grey, dashed with brown; ear-feathers dark iron-grey, forming a curve from the lower part of the eye, extending nearly across the head, under the crest; back grey; neck the same, much lighter; breast, belly, thighs, and coverts of the vent, white; coverts of the tail, greyish brown; scapulars, greater and lesser coverts of the wings, lead-colour; primaries at the base of the web, black, then dark grey, edged with white; each primary white at the end, near an inch; secondaries nearly the same; tertial greyish brown; under coverts of the wings white; tail cuneiform, very long, two middle feathers reddish brown, longer than the rest, which are ferruginous, tipt with near an inch of white, above which is a mark much larger, black; eye, speculum black, irides reddish brown; from the beak to the ear-feathers, and round the eye, bare; this part is black; legs and feet black, marked with dirty white at the joints; claws large and strong; length two feet five inches, from the tip of the beak to the tip of the tail; extent two feet four inches.

The last of these birds is to be met with in almost every part of the country, more particularly where there are jungles. I have seen a variety of them at *Burragong* in *Sircar Sarun*, where, instead of the horn, they had a large knob at the base of the beak, very much resembling that of a wild goose. The one I have attempted to give a description of, was brought to me at *Midnapore*, in which province, and the extending hilly country, they abound. I have seen them in the vicinity of *Sheergotty*.

The *Bagma Dunnase* chiefly inhabits the western range of hills, extending from *Neelgur* through *Mo-*

hurbunge, Midnapore, Ramgur, Rotas, towards *Bidzigur.* In *Ramgur,* I have been informed by an intelligent person, they are to be seen in abundance. He told me that he had seen crowds of them on the *peepul*-trees, the berry of which they feed upon at times.---Their note, or voice, in concert, has a strong resemblance to the mournful cries of monkies, for which this person, deceived by the sound, at first took them.---The place where I met with them was at *Midnapore,* in the *jungles* adjacent to which they are to be found from the month of *November* to the month of *March* only; at which time they retire to the hills to breed. I should have been highly pleased could my curiosity have been gratified in the inquiries I made respecting the economy of this extraordinary bird; but the people I had to deal with were poor ignorant folks, from whom I could gain but little information: I therefore can do little more than ascertain one curious fact, and display some qualities of the bird, which may hereafter be of benefit, if thoroughly investigated by some person of medical skill.

These birds have a most remarkable appearance when in the act of flying, from the great size of their beaks and length of tail. I have seen several of them in this state; and a more uncouth object I never beheld. The beak, which forms the most prominent feature in this strange bird, may be considered as one of the most uncommonly curious among the feathered tribe. The *Toucan,* the *Spoonbill,* the *Pelican,* the *Dodo,* and others, certainly claim the attention of the naturalist; but in my humble opinion the *Bægma* has merits far superior, on the ground of rarity. The largest beak I ever saw was produced from a bird shot at a place called *Kulur,* about nine miles from *Midnapore.* The following is the measurement:

	Inches.
Length of the beak in a straight line from its junction with the head - - -	8½
Length of the horn from the base to the point -	8½
Depth of the whole beak, including the horn, near	4½
The horn to its junction with the upper mandible	2¼
Each mandible in the centre of the beak -	1
Distance from the point of the horn to the point of the beak	3

It may be proper to observe here, that the beak forms a much greater curve than the horn, the point of which is parallel to its junction with the beak; whereas the point of the beak comes down an inch and a quarter below the lower mandible. The following is the measurement of the bird to which this beak belonged.

	Feet.	Inch.
Length from the forehead to the tip of the tail -	2	9
Circumference in the thickest part - -	0	15
Neck, from the chin to the shoulder - -	0	6
Body, from the shoulder to the rump - -	1	0
Tail, from the rump to the point - -	1	1
Height and breadth of the head - -	0	3½
Circumference of the neck in the middle - -	0	6
Length of the wing when closed - -	1	1¼
Ditto when open - - - -	1	5½
Extent when expanded from tip to tip - -	3	3
Length of the legs - - - -	0	1½
Ditto of the toes - - - -	0	2½
Ditto of the claws (largest) - - -	0	0
Circumference of the legs - - -	0	1½

I have to regret that I did not weigh this bird; indeed at the time, I had no idea that I should attempt the description of it; I can only therefore venture to guess that it might weigh about six or seven pounds. I took a drawing of the bird, which has enabled me to give the above account.

I endeavoured to acquire some information from the Bird-catchers respecting the use of the horn, upon

ON THE

LORIS, OR SLOW-PACED LEMUR.

BY THE PRESIDENT.

THE singular animal, which most of you saw alive, and of which I now lay before you a perfectly accurate figure, has been very correctly described by *Linnæus;* except that *sickled* would have been a juster epithet than *awled* for the *bent claws* on its hinder indices; and that *the size of a squirrel* seems an improper, because a variable measure: its configuration and colours are particularized also with great accuracy by M. *Daubenton;* but the short account of the *Loris,* by M. *De Buffon,* appears unsatisfactory, and his engraved representation of it has little resemblance to nature; so little that, when I was endeavouring to find in his work a description of the quadrumane which had just been sent me from *Dacca,* I passed over the chapter on the *Loris,* and ascertained it merely by seeing in a note the *Linnæan* character of the slow-paced *Lemur.* The illustrious *French* naturalist, whom, even when we criticise a few parts of his noble work, we cannot but name with admiration, observes of the *Loris,* that, *from the proportion of its body and limbs, one would not suppose it slow in walking or leaping;* and intimates an opinion, that *Seba* gave this animal the epithet of *slow-moving,* from some fancied likeness to the *Sloth* of *America:* but, though its body be remarkably long in proportion to the breadth

of it, and the hinder legs, or more properly arms, much longer than those before, yet the *Loris*, in fact, walks, or climbs, very slowly, and is, probably, unable to leap. Neither its genus nor species, we find, are new: yet, as its temper and instincts are undescribed, and as the *Natural History* by M. *De Buffon*, or *The System of Nature* by *Linnæus*, cannot always be readily procured, I have set down a few remarks on the *form*, the *manners*, the *name*, and the *country* of my little favourite, who engaged my affection while he lived, and whose memory I wish to perpetuate.

I. This male animal had four hands, each five-fingered; palms naked; nails round, except those of the indices behind, which were long, curved, pointed; hair very thick, especially on the haunches, extremely soft, mostly dark grey, varied above with brown and a tinge of russet; darker on the back, paler about the face and under the throat, reddish towards the rump; no tail, a dorsal stripe, broad, chesnut coloured, narrower towards the neck; a head almost spherical; a countenance expressive and interesting; eyes round, large, approximated, weak in the day-time, glowing and animated at night; a white vertical stripe between them; eye-lashes black, short; ears dark, rounded, concave; great acuteness at night, both in seeing and hearing; a face hairy, flattish; a nose pointed, not much elongated; the upper lip cleft; canine-teeth, comparatively long, very sharp.

More than this I could not observe on the living animal; and he died at a season when I could neither attend a dissection of his body, nor with propriety request any of my medical friends to perform such an operation during the heats of *August*; but I opened his jaw and counted only two incisors above,

and as many below, which might have been a defect in the individual; and it is mentioned simply as a fact, without any intention to censure the generic arrangement of *Linnæus*.

II. In his manners he was for the most part gentle, except in the cold season, when his temper seemed wholly changed; and his Creator, who made him so sensible of cold, to which he must often have been exposed even in his native forests, gave him, probably for that reason, his thick fur, which we rarely see on animals in these tropical climates. To me, who not only constantly fed him, but bathed him twice a week in water accommodated to the seasons, and whom he clearly distinguished from others, he was at all times grateful; but, when I disturbed him in winter, he was usually indignant, and seemed to reproach me with the uneasiness which he felt, though no possible precautions had been omitted to keep him in a proper degree of warmth. At all times he was pleased with being stroked on the head and throat, and frequently suffered me to touch his extremely sharp teeth; but at all times his temper was quick, and when he was unseasonably disturbed, he expressed a little resentment by an obscure murmur, like that of a squirrel, or a greater degree of displeasure by a peevish cry, especially in winter, when he was often as fierce, on being much importuned, as any beast of the woods. From half an hour after sunrise to half an hour before sunset, he slept without intermission, rolled up like a hedge-hog; and as soon as he awoke, he began to prepare himself for the labours of *his* approaching day, licking and dressing himself like a cat; an operation which the flexibility of his neck and limbs enabled him to perform very completely; he was then ready for a slight breakfast, after which he commonly took a short nap; but when the sun was quite set, he recovered all his vivacity. His ordinary food was the

sweet fruit of his country: plantains always, and mangos during the season; but he refused peaches, and was not fond of mulberries, or even of guaiavas; milk he lapped eagerly, but was contented with plain water. In general, he was not voracious, but never appeared satiated with grasshoppers; and passed the whole night, while the hot season lasted, in prowling for them. When a grasshopper, or any insect, alighted within his reach, his eyes, which he fixed on his prey, glowed with uncommon fire; and, having drawn himself back to spring on it with greater force, he seized the victim with both his fore-paws, but held it in one of them while he devoured it. For other purposes, and sometimes even for that of holding his food, he used all his paws indifferently as hands, and frequently grasped with one of them the higher part of his ample cage, while his three others were severally engaged at the bottom of it; but the posture of which he seemed fondest, was to cling with all four of them to the upper wires, his body being inverted; and in the evening he usually stood erect for many minutes playing on the wires with his fingers, and rapidly moving his body from side to side, as if he had found the utility of exercise in his unnatural state of confinement. A little before day-break, when my early hours gave me frequent opportunities of observing him, he seemed to solicit my attention; and if I presented my finger to him, he licked or nibbled it with great gentleness, but eagerly took fruit when I offered it; though he seldom eat much at his morning repast. When the *day brought back his night*, his eyes lost their lustre and strength, and he composed himself for a slumber of ten or eleven hours.

III. The names *Loris* and *Lemur* will, no doubt, be continued by the respective disciples of *Buffon* and *Linnæus*; nor can I suggest any other, since the *Pandits* know little or nothing of the animal. The

lower *Hindus* of this province generally call it *Lajjá-bánar*, or the Bashful Ape; and the *Mussulmans*, retaining the sense of the epithet, give it the absurd appellation of a Cat; but it is neither a cat nor bashful; for though a *Pandit*, who saw my *Lemur* by day-light, remarked that he was *Lajjalu*, or *modest* (a word which the *Hindus* apply to all *sensitive plants*) yet he only seemed bashful, while in fact he was dim-sighted and drowsy; for at night, as you perceive by his figure, he had open eyes, and as much boldness as any of the *Lemures*, poetical or *Linnæan*.

IV. As to his country, the first of the species that I saw in *India* was in the district of *Tipra*, properly *Tripura*, whither it had been brought, like mine, from the *Garrow* mountains; and Dr. *Anderson* informs me, that it is found in the woods on the coast of *Coromandel*. Another had been sent to a member of our Society from one of the eastern isles; and though the *Loris* may be also a native of *Silân*, yet I cannot agree with M. *De Buffon*, that it is the minute, sociable, and docile animal mentioned by *Thevenot*, which it resembles neither in size nor in disposition.

My little friend was, on the whole, very engaging; and when he was found lifeless, in the same posture in which he would naturally have slept, I consoled myself with believing that he had died without pain, and lived with as much pleasure as he could have enjoyed in a state of captivity.

ASTRONOMICAL OBSERVATIONS

MADE IN THE UPPER PARTS OF HINDOSTAN, AND ON A JOURNEY THENCE TO OUJEIN.

BY WILLIAM HUNTER, ESQ.

BEFORE delivering the following observations, it will be proper to give some account of the instruments with which they are made. The altitudes for determining latitudes and time, were taken with a sextant of ten inches radius, made by *Troughton*: the limb is divided into degrees and thirds of a degree, and the divisions on the vernier go to half minutes; so that, by the help of the magnifying lens, a difference of ten seconds is sufficiently perceptible. The two specula, being screwed down in their places, do not (as far as I can discover) admit of the principal or vertical adjustment: but the error was almost daily ascertained by the double mensuration of the sun's diameter, and constantly allowed for. It is subtractive; and my determination of its quantity varied from 2′ 30″ to 3′ 30″. These differences may have in part arisen from a real variation in the quantity of this correction; but I ascribe them chiefly to some inaccuracy in my mensuration of the sun's diameter. To form some judgment of the influence this cause might have, I have examined twenty-three of those measurements, made between the 7th of *March* and the 7th of *June* (being all of which I have any record)

by taking the medium of the sun's diameters, as measured on the limb, to the right and left of zero, and comparing it with the diameter for that day, as laid down in the *Ephemeris*. It will appear, from a list of those observations, that my measurements commonly exceeded those given in the *Ephemeris;* but the greatest excess was 25″.

MENSURATIONS OF THE SUN'S DIAMETER.

1792.	Adjustment of Sextant. Subtract.		Difference of the Sun's diameter, measured from that in the Ephemeris.	
March 7	2′	34″	+	8′
9	3	—	+	14
11	2	30	+	14
13	2	52	+	24
15	3	15	+	1
17	3	15	+	3
18	3	7	+	10
19	3	15	+	3
20	3	7	+	25
21	3	15	+	4
22	3	15	+	20
23	3	22	+	12
24	3	8	+	13
25	3	15	+	7
28	3	15	+	9
31	3	15	+	10
April 1	3	15	+	11
3	3	15	+	12
10	3	30	—	3
11	3	15	+	15
17	3	—	+	5
May 29	2	37	—	7
June 7	2	52	+	1

These mensurations may have a farther use, besides ascertaining the adjustment of the quadrant: If the eye could determine, with perfect accuracy, the contact of the limbs, the mean between the two measurements of the sun's diameter would be exactly equal to his apparent diameter, as determined by calculation, and given in the *Ephemeris;* but, from the imperfection of our organs, it happens that the limbs will sometimes appear to be in contact, when a little space remains between them; at others, when they overlap one another: in the former case, the diameter will appear greater; in the latter, less than the truth. But it is probable that, at nearly the same period of time, the state of the eye, or of the sensorium, by which we judge of this contact, is, in the same person, nearly the same. Of this I have made some trials, and found, that, when the sun's diameter, by my mensuration, differed from that in the *Ephemeris,* on repeating the mensurations, at short intervals, the difference remained nearly the same. Therefore, if we observe the sun's altitude a little time before or after measuring his diameter, the contact of the limbs will, probably, appear to take place in the same real situation of those limbs as when we measured the sun's diameter. But here, the effect of too open or too close observation will be reversed; the former making the altitude appear less; the latter, greater than the truth. These measurements then may be applied as corrections of the observed altitude. Thus, if the diameter of the sun has appeared too great, add the quantity of its excess to the angle observed, between the sun and his image in *Mercury;* if it appeared too small, subtract the defect, to give the true angle. Thus, *March* the 13th, the error of the sextant was 2′ 52″ to be subtracted; but the measurement of the sun's diameter exceeds the truth by 24″. Therefore, this quantity

is to be added to the observed angle, the observation being, probably, so much too open.

The angle between the sun and his image in quicksilver, that day at noon, was			123°	33′	45″
Error Sextant	—	2′ 52″			
Do. Observation	×	0 24			
		------Diff.	—	2	28
			2) 123	31	17
			61	45	38 5
Diff. refr. and parallax		—			26 5
			61	45	12
Sun's Semidiameter		+		16	7
			62	1	19
Sun's Declin. South		+	2	36	23
Co-Latitude - - - - - - - - -			64	37	42
Latitude of *Burwa Sagur* - - -			25	22	18

which is 13″ less than in the following list, where this error was not allowed for.

The secondary, or horizontal adjustment, made by a small screw at the fore-part of the little speculum, was, from time to time, carefully attended to.

The altitudes were taken by means of the image in quicksilver, which, if the sun was the object, was defended from the wind by a covering of thin gauze, as recommended by *Mr. Burrow* in the first volume of the *Asiatic Researches*. When the altitude of a star was to be taken, this method did not answer, as it rendered the image too obscure. A thick cloth

was therefore properly disposed to windward of the mercury.

The small telescope belonging to the sextant was used in all the observations.

As the instrument is only graduated to 125 degrees, I could not take altitudes exceeding 62 degrees. While the sun's meridian altitude could be observed, I have preferred it for the latitude; but, as this was soon about to be impracticable, I began, on the 29th of *February*, to compare the latitudes by meridian altitude, with those obtained from two altitudes and the elapsed time, by the rule in the requisite tables, in order to judge how far the latter might be depended on. The result of the comparison, which appears in the observations from that time to the 15th of *March*, determined me to trust to those double altitudes, while they could be taken within the prescribed limits; at the same time, comparing them occasionally with observations by a fixed star. From the first of *April*, I was obliged to trust entirely to the stars; and, to make the observations by them as accurate as possible, I have, when circumstances would allow, taken the meridian altitude of one to the north, and another to the south, of the zenith. The telescope is an achromatic, made by *Dollond*, of twenty-eight inches focal distance. It inverts the object, and magnifies eighty times.

The watch is made by *Brookbank*, with horizon balance-wheel, and continues to go while winding up. To determine, as accurately as possible, the time of an observation, I took equal altitudes of the sun, on the days preceding and following it, and, having thus found the quantity gained or lost in twenty-four hours, applied to the time of observation

a part proportional to its distance from the preceding or following noon. In this calculation, allowance was made for the difference of longitude (ascertained by geometrical surveys) if the altitudes on the two days were taken at different places. Besides this I have, when I had the opportunity, taken the altitudes of two fixed stars, one to the east, and another to the west of the meridian, within an hour before or after the observation, and calculated the time from them,

OBSERVATIONS OF LATITUDE.

1791.	PLACE.	Sun or Star.	Latitude.	REMARKS.
May 24	Agra; monument of Taj Mahl, ...	α ♏	27 10 00	Doubtful.
N 25	Ditto,	α ♏	27 10 11	Distinct.
ov. 1	Lucknow; Mr. Taylor's House, ...	⊙	26 51 9	Clear.
24	Futtehgurh; Mr. Phillips's Bungalow, near the centre of cantonments, ...	⊙	27 21 5	Cloudy.
25	Ditto, ...	⊙	27 21 54	Clear.
26	Ditto, ...	⊙	27 22 46	Ditto.
28	Ditto, ...	⊙	27 21 44	Ditto.
Dec. 4	Gureiah village; bearing N ½ E ½ mile, ...	⊙	27 28 42	Ditto.
9	Ditto,	⊙	27 29 11	Ditto.
Jan. 24	Dehliah; near the Bungalow, ...	⊙	27 21 5	
25	Nawabgunge; Bungalow, E distant 3 furl.	⊙	27 26 12	
26	Allygunge; Mosque, S 72 E.....	⊙	27 30 00	
27	Doomree; Fort, S 22 E distant 2½ furl.	⊙	27 32 41	Clear, windy.
28	Sukheet; NW 2½ furl.....	⊙	27 25 15	Sun had begun to fall.
29	Giroul; Fort, S 10 W 1½ furl.....	⊙	27 11 13	
30	Shekohabad; Agra-gate, S 55 E 7 furl.	⊙	27 6 58	
Feb. 1	Feerozabad; Gate, SE 3 furl.....	⊙	27 9 14	
2	Eitumadpoor; Tank, S 67 W 2 furl.	⊙	27 14 7	
3	Agra; monument of Taj Mahl, ...	⊙	27 10 22	
9	Ditto, ...	⊙	27 10 38	
20	Camp at Gober Chokey, ...	⊙	27 9 23	Cloudy.
21	Ditto, ...	⊙	27 9 51	Clear.

OBSERVATIONS OF LATITUDE.

1792.	PLACE.	Sun or Star.	Latitude.	REMARKS.
Feb. 23	Baad; bearing N 2 E distant 3 furl.	⊙	27 3 23	
24	Munniab; S 30 W 1 furl.	⊙	26 49 48	
25	Dholpour; S 8 W 3 furl.	⊙	26 41 41	
27	Choola; Fort, N 44 W 3	⊙	26 37 25	A cloud came over the sun before he reached the meridian.
28	Noorabad; Garden, S 3 E 2	⊙	26 24 17	Clear and windy.
29	Gualior; Hill, S 3 E—S 45 E	⊙ M. A.	26 15 7	
	Ditto,	⊙ 2 A.	26 15 38	
Mar. 2	Ditto,	⊙ M. A.	26 14 48	
6	Antery; Fort, S 10 W distant 4 furl.	⊙ M. A.	26 4 20	
7	Dibborah,	⊙ M. A.	25 53 43	
	Ditto,	⊙ 2 A.	25 53 51	
8	Ditteah; S 32 E distant 3½ miles,	⊙ M. A.	25 43 1	
	Ditto,	⊙ 2 A.	25 43 9	
9	Ditto; Rajah's House, N W 3 furl.	⊙ M. A.	25 39 44	
	Ditto,	⊙ 2 A.	25 39 27	
11	Jhansy; S E angle fort, N 88 E 2½ furl.	⊙ M. A.	25 27 56	
	Ditto,	⊙ 2 A.	25 28 1	
12	Ditto,	⊙ M. A.	25 27 45	
13	Burwah-Sagur; Castle, N 51 E 7½ furl.	⊙ M. A.	25 22 31	
	Ditto,	⊙ 2 A.	25 21 16	
14	Ditto,	⊙ M. A.	25 22 31	Clear.
15	Pirtipoor; N 80 W—N 18 E 1½ furl.	⊙ M. A.	25 12 53	

OBSERVATIONS OF LATITUDE.

1792.	PLACE.	Sun or Star	Latitude.	REMARKS.
Mar.	Pirtipoor; N 80 W—N 18 E 1½ furl.	⊙ 2 A.	25 12 53	
16	Bumaury; N 2 W—N 42 W 1½ furl.	⊙ 2 A.	24 2 6	
17	Belgaung; N 1 furl.	⊙ 2 A.	24 53 11	
18	Teary; N 55 E 2	⊙ 2 A.	24 43 30	
19	Marouny; Fort, S 75 E 2	⊙ 2 A.	25 35 11	
20	Sindwaha; N 55 E 2	⊙ 2 A.	24 31 34	
21	Narat; Temple of Hanumân, S 14 E 3½	⊙ 2 A.	24 24 25	
	Ditto, ...	β U. M.	24 24 40	
22	Maltown; Fort, N 14 E dist. 10 furl.	⊙ 2 A.	24 17 30	
23	Khémlásah; N 48 E—N 57 W 2	β U. M.	24 13 44	
24	Rámpoor; N 5 E—N 43 W	⊙ 2 A.	24 6 18	Windy.
	Ditto, ...	α ♏	24 7 25	Ditto.
25	Koorwey; Fort, N 42—52 W 3	⊙ 2 A.	24 7 34	Ditto.
26	Kirway; close to the village, ...	⊙ 2 A.	23 57 31	Ditto.
27	Basouda; N 35 W 3	⊙ 2 A.	23 53 25	Ditto.
	Ditto, ...	β U. M.	23 40 56	Clear, moderate, a distinct observat.
28	North Bank of Gulcutta River, ...	⊙ 2 A.	23 41 48	Clear, calm.
29	Bhelsah; S 56 C 4	⊙ 2 A.	23 31 19	Ditto.
	Ditto, ...	β U. M.	23 32 1	Ditto.
30	Ditto, ...	β U. M.	23 31 39	Ditto.
31	Ditto, ...	α ♏	23 32 5	Ditto.
April 1	Golgaung; N 58 E 2	⊙ 2 A.	23 31 33	Clear, moderate.
	Ditto, ...	β U. M.	23 28 46	Clear, calm.

1792.	PLACE.	Sun or Star.	Latitude.	REMARKS.
April 2	Amáry; N 67 E 2	β U. M.	23 25 24	
	Ditto, ...	α ♏	23 24 29	
4	Bopaul; Futtehgurh fort, S 62—68 W 1 mile,	β U. M.	23 15 46	
	Ditto, ...	α ♏	23 16 35	
5	Ditto, ...	β ♎	23 15 58	
7	Pundah; N 42 ES 82 E—1 furl.	β U. M.	23 13 50	
	Ditto, ...	α ♏	23 13 45	
8	Sehoue; S 85 E 2½	α ♏	23 12 00	
9	Furher; N 28 35 W 4½	β U. M.	23 14 5	
10	Shujawulpoor; N 18 W N 80 E 3	β U. M.	23 24 54	
11	Beinfroud; N 64 E—S 65 E 1	α Hydræ	23 25 54	
12	Shahjehanpoor; S 83 W	α Hydræ	23 26 9	
	Ditto, ...	β U. M.	23 25 46	
13	Turána; N 70 W 3½	α Hydræ	23 20 2	
	Ditto, ...	β U. M.	23 19 39	
14	Tajpoor; close to the village, ...	α Hydræ	23 14 47	
	Ditto, ...	β U. M.	23 13 1	
15	Oujein; near Rana Khan's Garden, ...	α Hydræ	23 12 9	
16	Ditto, ...	α Hydræ	23 12 13	
	Ditto, ...	β U. M.	23 10 58	
18	Ditto, ...	α Hydræ	23 12 13	
19	Ditto, ...	β U. M.	23 10 50	
23	Ditto, ...	α ♏	23 11 28	
May 29	Ditto; house near Scindiah's palace, ...	α ♏	23 11 8	
June 14	Ditto, ...	α ♏	23 10 45	

Eclipses of Jupiter's Satellites, observed with Mr. Dollond's Achromatic Telescope, magnifying 80 times.

Apparent Time.				Satell.	Im. or Em.	Place of Observation.	Longitude.			Weather,	Remarks.
1791.	D.	H.	′ ″				°	′	″		
May	11	11	58 56	1	Em.	Agra; Monument Taj Mahl,	78	11	00	clear, windy,	
	18	7	44 24	2	Em.	Ditto, ...	77	58	00	clear, moderate,	
	26	10	22 10	2	Em.	Ditto, ...	78	22	00	Ditto,	
June	19	10	25 26	1	Em.	Ditto, ...	78	27	15	Ditto,	N. B. The immersion also happened some minutes earlier than it ought, agreeably to the longitude commonly assigned to Agra.
	24	10	13 41	3	Em.	Ditto, ...	77	20	30	Ditto,	
Dec.	27	17	17 42	3	Em.	Futtehgurh; Mr. Phillips's B.	79	28	15	Ditto,	
	31	16	13 26	2	Im.	Ditto, ...	79	1	30	Ditto,	
1792.											
Jan.	17	17	6 53	1	Im.	Ditto, ...	79	32	45	cloudy, calm,	
	26	13	24 8	1	Im.	Allygunge, ...	79	00	30	clear, calm,	A distinct observation.
Feb.	1	15	27 52	2	Im.	Feerozabad, ...	78	13	15	Ditto,	
	2	15	12 32	1	Im.	Eätumádpoor, ...	78	1	30	Ditto,	Telescope somewhat unsteady.
	8	17	57 17	2	Im.	Agra; Monument Taj Mahl,	77	33	00	thin clouds, calm,	Day beginning to break.
	9	17	4 19	1	Im.	Ditto, ...	77	41	30	clear, calm,	
	18	13	27 1	1	Im.	Ditto, ...	77	47	30	a little hazy, calm,	A distinct observation.
Mar.	15	10	33 48	3	Im.	Pirtipoor, ...	77	29	15	clear, calm,	
		12	31 48	3	Em.	Ditto, ...	77	52	00	Ditto,	
	21	10	7 5	1	Im.	Narat, ...	78	2	00	Ditto,	
	22	9	23 58	2	Im.	Maltown, ...	77	56	15	Ditto,	
	28	12	2 4	1	Im.	N. Bank, Gulcutta R.	77	44	15	Ditto,	A distinct observation.
	29	11	57 13	2	Im.	Bhélsah, ...	72	22	45	Ditto.	Planet at the instant of immersion somewhat obscure.

Eclipses of Jupiter's Satellites, continued.

Apparent Time.				Satellite.	Im. or Em.	Place of Observation.	Longitude.	Weather.	Remarks.
1792.	H.	D.	′	″			° ′ ″		
Apr.	5	14	31	52	2	Im.	Bopaul, ...	77 9 45	clear, calm,	
	6	8	26	6	1	Im.	Ditto, ...	77 24 30	Ditto,	
	13	10	17	23	1	Im.	Turána, ...	76 10 15	Ditto,	
	20	14	22	18	1	Em.	Ugein; near Rana Khan's Gard.	76 19 00	clear, windy,	
	22	8	48	49	1	Em.	Ditto, ...	75 43 30	clear, moderate,	
	23	11	27	55	2	Em.	Ditto, ...	75 20 00	Ditto,	
	29	10	44	42	1	Em.	Ditto, ...	75 48 00	Ditto,	
	30	14	4	25	2	Em.	Ditto, ...	75 46 45	Ditto,	
May	6	12	40	21	1	Em.	Ditto, ...	75 51 15	Ditto,	
	13	14	36	11	1	Em.	Ditto, ...	76 7 45	Ditto,	
	15	9	3	22	1	Em.	Ditto, ...	75 46 00	Ditto,	Time from obs. of Regulus—Time from eq. alt. of ⊙ on 14th & 16th.
		9	2	28	1	Em.	Ditto, ...	75 32 30	Ditto,	
	29	12	52	41	1	Em.	Ugein; House near Scindiah's,	76 00 56	hazy,	Satellite emerging, very dim.
June	7	9	14	21	1	Em.	Ditto, ...	75 55 00	clear, moderate,	Observation very distinct.
	14	11	7	49	1	Em.	Ditto, ...	75 56 00	Ditto,	Ditto.

Not having the opportunity of comparing these observations with contemporary ones taken at Greenwich, or at places the longitudes of which from that observatory are ascertained, I have considered the times of the Eclipses given in the Ephemeris as accurate, and then deduced the longitude from Greenwich.

LATITUDES OBSERVED.

1792.	PLACE.	Sun or Star.	Latitude.	Remarks.
Oct. 7	Oujein; Camp at Shah Dawul's Durgah, ...	⊙ M. A.	23 12 3	Clear, calm.
8	Ditto, ...	ditto,	23 11 45	
1793.				
Feb. 24	Ditto; Camp near Rana Khan's Garden, ...	ditto,	23 11 30	
Mar. 13	Ditto; Camp at Unk-Pat, ...	α Hydræ	23 14 2	
14	Gutteah, ...	α Hydræ	23 23 55	
15	Tenauriah, ...	ditto,	23 36 10	
16	Ager, ...	ditto,	23 43 48	
17	Soosner; N 10 68 W distant 2 furl.	Sirius,	23 56 47	med. 23° 57′ 21″.
		α Hydræ	23 57 56	
18	Perawa, ...	ditto,	24 9 11	med. 24° 9′ 14″.
			24 9 18	
19	Soonel; N 18 W distant 3 58 furl.	Sirius,	24 12 11	
21	Julmee; from S to S 35 W distant 2 33 furl. ..	α Hydræ	24 36 4	
22	Mucundra, ...	α Hydræ	24 49 27	
23	Puchpahar; N 10 E distant 4 5 furl.	β U. M.	24 59 39	
24	Anandpoor, ...	ditto,	25 6 40	
		α ♏	25 7 31	med. 25° 7′ 5″.
25	Kotah; Camp near Bag-Dur-waza, ...	β U. M.	25 11 41	
28	Gaumuch; S 77 E distant 3 furl.	ditto,	25 16 56	
29	Teekeree; S 10—60 W distant 1 furl.	ditto,	25 20 53	
30	Boonde; Rajah Mahl, N 42 W	ditto,	25 26 38	
31	Dublana; from S to S 80 E distant 1 furl.	ditto,	25 35 45	
Apr. 1	Doogaree; SW	ditto,	25 40 00	

1793.	PLACE.	Sun or Star.	Latitude.	Remarks.
April 2	Bahmen-gaung; E to S 15 E distant 1 furl. ..	β U. M.	25 45 8	Cloudy, uncertain
3	Ooniara; S to S 53 E distant 7 furl.	Ditto,	25 53 8	Ditto,
4	Ditto, ...	Ditto,	25 54 53	Clear, med. 25° 55′ 4″.
6	Ditto	Ditto,	25 55 15	Clear, moderate, ditto.
8	Burwarah; S 22 E to N 47 E dist. extremes, 2 f.	Ditto,	26 3 31	Ditto.
9	Bhugwunt-gurh; N 30—85 W distant 3 furl. ..	Ditto,	26 9 16	Ditto.
10	Khernee; S 30—82 E distant 1 furl.	Ditto,	26 16 9	Ditto.
11	Mularna; S 57—80 W distant 3 0 furl.	Ditto,	26 19 9	Ditto, windy.
12	Amergurh; S 20 E distant 2 furl.	Ditto,	26 27 9	Ditto, moderate.
13	Khoosh-hal-gurh; N 55—65 E dist. 4 furl.	α Hydræ	26 28 9	Ditto, Ditto, med. 26° 28′ 22″
	Ditto, ...	β U. M.	26 28 34	Ditto, Ditto, Ditto.
14	Peelaudoh; N 60—80 E distant 3 furl.	α Hydræ	26 35 54	Ditto, Ditto, med. 26° 36′ 16″
	Ditto, ...	β U. M.	26 36 39	Ditto, Ditto, Ditto.
15	Hindoun; N 12 W to N 80 E dist. nearest 1 f.	α Hydræ	26 43 24	Ditto, Ditto, med. 26° 43′ 31″
	Ditto, ...	β U. M.	26 43 39	Ditto, Ditto, Ditto.
16	Surout; S 48 W to W distant 2 6 furl.	β U. M.	26 49 9	Ditto, Ditto, med. 26° 48′ 54″
	Ditto, ...	β ♎	26 48 39	Ditto, Ditto, Ditto.
17	Biana; S 32 W to S 48 E distant 1 furl.	α Hydræ	26 55 40	Ditto, Ditto, med. 26° 55′ 24″
	Ditto, ...	β U. M.	26 55 9	Ditto, wind, Ditto.
18	Rudawul; N 5—50 W distant 2 furl.	α Hydræ	26 58 25	Ditto, moderate.
19	Kanau; S 69 E to N 88 E distant 3 furl.	Ditto	27 2 25	Ditto, Ditto, med. 27° 2′ 10″
	Ditto, ...	β U. M.	27 1 55	Ditto, Ditto, Ditto.
20	Futtehpoor; Camp within Chunnunp. Dur-waza,	α Hydræ	27 5 55	Ditto, Ditto, med. 27° 5′ 43″
	Ditto, ...	β U. M.	27 5 32	Ditto, Ditto, Ditto.

Eclipses of Jupiter's Satellites.

Apparent Time.	Satellites.	Im. or Em.	Place of Observation.	Longitude.	Weather.	Remarks.
1793. D. H. ′ ″				° ′ ″		
Mar.24 12 48 26	1	Im.	Anandpoor	75 25 30	clear, moderate,	
30 13 16 29	2	Im.	Bondee	75 6 15	Ditto,	
31 14 43 35	1	Im.	Dublana	75 15 45	Ditto,	
Apr. 6 10 55 26	3	Em.	Ooniara	76 25 45	Ditto,	The Satellite had emerged sometime before I perceived it.
— 15 54 6	2	Im.	Ditto	75 41 45	Ditto,	By observations of Procyon and Arcturus, at ½ past 9 P. M. watch slow 10′ 56″ and by this the time is adjusted. But on the 7th at 7½ A. M. by the Sun, watch slow, only 8′ 5″, being 2′ 51″ gained in 10 hours. If we allow a proportionable gain to the time of immersion, 1′ 49″ the time was 15° 52′ 17″, and longitude 75° 14′ 30″.
9 11 11 26	1	Im.	Bhugwunt-gurh	76 2 30	Ditto,	
13 13 1 8	3	Im.	Khoosh-hal-gurh	75 57 3	Ditto,	Med. 76° 3′.
— 14 54 38	3	Em.	Ditto	76 8 30		
16 13 10 24	1	Im.	Surout	76 51 30	Ditto,	
May 9 13 27 45	1	Im.	Agra, Rozeh Taj Mahl	77 36 45	Ditto.	

1793. Feb. 25th, at Oujein, Moon eclipsed.

At 3 P. M. watch by the Sun		10′ 58″ slow	}	
At 12¼ P. M. do.	Procyon	9 59 do.	}	med. 10′ 30″
At 14¾ do.	Lyra	10 32 do.	}	
By Watch	14° 14′ —″			
	+ 10 30			
Appar. time,	14 24 30	A slight obscurity began on the Moon's N. E. limb.		
	14 18 —			
	+ 10 30			
	14 28 30	Dark shadow distinctly seen to enter.		
	17 00 00			
	+ 10 30			
	17 10 30	Eclipse ended—Limb clear.		

If we reckon the beginning of the eclipse from the first perceptible obscurity, *i. e.*	14° 24′ 30″	
Then beginning by *Ephemeris* ..... —	9 23 45	
Difference of Longit. in time, ...	5 00 45	75 11′ 15″
But, reckoning from the entrance of the dark shadow, the difference is.....	5 4 45	76 11 15
The end, by observation	17 10 30	
By *Ephemeris* ..... —	12 6 30	
	5 4 00	76 00 00
Beginning of obscurity	14 24 30	
End	71 10 30	
Middle	15 47 30	
Ditto, by *Ephemeris*..... —	10 45 15	
	5 2 15	75 33 45
Duration observed	2 46 00	
By *Ephemeris* ..... —	2 42 45	
Excess of observation	00 3 15	

As the state of the limbs at the times marked as the beginning of obscurity and end of the eclipse were similar, if we add half this difference (1′ 37″) to the first of these times, and subtract it from the last, we shall have the beginning..... 14° 26′ 7″

End 17 8 53

Either of which will give the longitude .. 75 35 40

REMARK BY THE PRESIDENT.

The observations with which Mr. *Hunter* has favoured us, will be a valuable acquisition to all *Indian* geographers and antiquaries; for since *Ujjayinì*, or *Ujjein*, is in the first meridian of the *Hindus*, its longitude ascertains the position of *Lancá* on the equator, and fixes the longitude, at least according to the *Hindu* astronomers, of *Curucshétra*, *Vatsa*, the Pool *Samnihitæ Cánchì*, and other places, which are frequently celebrated in *Sanscrit* books of the highest antiquity. Hence also we shall possibly ascertain the seven *dwípas*, which, on the authority of *Patanjali* and of the *Véda* itself, we may pronounce to be neither the *seven planets* nor the *seven climates*, but great *peninsulas* of this earth, or large tracks of land with *water on both* sides of them. For example, in a preface to the *Súrya Siddhánta*, the peninsula, called *Sálmala*, is declared to be 422 *Yójanas* to the east of *Lancà;* now a true *Yójana* is equal to 4½ geometrical miles; and the longitude of *Sálmala* will thus bring us to the Gulph of *Siam*, or to the eastern *Indian* peninsula beyond *Malacca*. There is a passage in one of the *Puránas* which confirms this argument; where king *Srávana* is described "on the *White Mountain* "in the extensive region of *Sálmaladwipa*, meditat- "ing on the traces of the divine *foot*, at a place called "*the station of Trivicrama*." Now we are assured, by credible travellers, that the *Siamese* boast of a rock in their country, on which a *footstep*, as they say, of *Vishnu* is clearly discernible.

QUESTIONS AND REMARKS ON THE ASTRONOMY OF THE HINDUS.

BY JOHN PLAYFAIR, A. M.
PROFESSOR OF MATHEMATICS, AT EDINBURGH.

WRITTEN 10TH OF OCTOBER, 1792.

PRESUMING on the invitation given with so much liberality in the Advertisement prefixed to the second volume of the *Asiatic Researches*, I have ventured to submit the following queries and observations to the President and other Members of the learned Society in *Bengal*.

I.

Are any Books to be found among the Hindus, which treat professedly of Geometry?

I am led to propose this question, by having observed, not only that the whole of the *Indian* Astronomy is a system constructed with great *geometrical* skill, but that the *trigonometrical* rules given in the translation from the *Súrya Siddhánta*, with which Mr. *Davis* has obliged the world, point out some very curious theorems, which must have been known to the author of that ancient book. The rule, for instance, by which the trigonometrical canon of the *Hindu* astronomers is constructed*, involves in it the following

* 2 Asiatic Researches, 245.

theorem: "If there be three arches of a circle in "arithmetical progression, the sum of the sines of the "two extreme arches is to twice the sine of the mid-"dle arch as the co-sine of the common difference "of the arches to the radius of the circle." Now this theorem, though not difficult to be demonstrated, is yet so far from obvious, that it seems not known to the mathematicians of *Europe* till the beginning of the last century, when it was discovered by *Vieta*. It has ever since been used for the construction of trigonometrical tables, as it affords a method of calculating the sines and arches much easier than that which depends on successive extractions of the Square Root. To find that this theorem was known to the *Bráhmins* many ages ago, is therefore extremely curious; and the more so, because there is some reason to think that the commentator on the *Siddhánta*, quoted and translated by Mr. *Davis* †, did not understand the principle of this rule, since the method which he lays down is entirely different, much less profound in theory, and much more difficult in practice. If this be true, it indicates a retrograde order in the progress of eastern science, which must have had its origin in a very remote age.

II.

Are any books of Hindu Arithmetic to be procured?

It should seem that, if such books exist, they must contain much curious observation, with many abridgments in the labour of calculating, and the like; all which may be reasonably expected from them, since an arithmetical notation, so perfect as that of *India*, has existed in that country much longer than in any other; but that which most of all seems to deserve the attention of the learned, is, the discovery said to

† P. 246, 247.

be made of something like *Algebra* among the *Hindus;* such as the expression of number *in general* by certain symbols, and the idea of negative quantities. These certainly cannot be too carefully inquired into; and will, it is hoped, be considered by the Society of *Calcutta* as a part of that rich mine from which they have already extracted so many valuable materials. The problem mentioned by Mr. *Burrow** proves, that the *Hindus* have turned their attention to certain arithmetical investigations, of which there is no trace in the writings of the *Greek* mathematicians.

III.

Must not a complete Translation of the Súrya Siddhánta be considered as the grand desideratum with respect to Indian Astronomy?

Sir W. Jones gives us reason, I think, to hope that this will be executed by Mr. *Davis;* and the specimen which that gentleman has exhibited, leaves as little reason to doubt of his abilities to translate the work accurately, as of the great value of the original: I have therefore only to express a wish that, if there be any diagrams in the *Súrya Siddhánta,* they may be carefully preserved.

IV.

Would not a Catalogue Raisonné, containing an enumeration, and a short account of the Sanscrit Books on Indian Astronomy, be a work highly interesting and useful?

V.

Might not an actual Examination of the Heavens, in company with a Hindu Astronomer, to ascertain

* 2 Asiatic Researches, 495.

all the Stars and Constellations, for which there are names in Sanscrit, prove a most valuable addition to our knowledge of Indian Astronomy?

Let me here take the liberty of reminding the President of his promise to make such an examination; by which the mistakes concerning the *Indian* Zodiac, some of which he has already pointed out, may be decisively corrected.

VI.

May it not be of consequence to procure descriptions of the principal astronomical buildings and instruments of which any remains are still to be found, and which are certainly known to be of Hindu origin?

Under this head I would comprehend not only such works as the *Observatory* at *Benares*, which is well described by Sir *Robert Barker*, but also such instruments as the *Astrolabe*, mentioned by Mr. *Burrow* in the Appendix to the second volume of the *Asiatic Researches;* and engravings of such instruments will be necessary to accompany the descriptions.

Though in the preceding questions there may be nothing that has escaped the attention of the Society in *Bengal*, yet they will, perhaps, be forgiven to one who feels himself deeply interested in the subject to which they relate, and who would not lose even the feeblest ray of a light, which, without the exertions of the *Asiatic* Society, must perish for ever.

REMARK BY THE PRESIDENT.

We shall concur, I am persuaded, in giving our public thanks to Professor *Playfair* for the Questions which he has proposed; and in expressing our wish, that his example may be followed by the learned in *Europe.* Concise answers to his queries will be given in my next annual discourse; the subject of which will comprise a general account of *Indian* astronomy and mathematics. I would long ago have accomplished my *design* (which I never meant as a *promise* to be performed in all events) of examining the heavens in company with an intelligent *Hindu* astronomer, if such a companion could have been found in this province; but, though I offered ample stipends to any *Hindu* astronomer who could name, in *Sanscrit,* all the constellations which I should point out; and to any *Hindu* physician who could bring me all the plants named in *Sanscrit* books, I was assured by the *Brahmin* whom I had commissioned to search for such instructors, that no *Pandit* in *Bengal* even pretended to possess the knowledge which I required. Lieut. *Wilford,* however, has lately favoured me with a *Sanscrit* work, procured by him at *Benares,* containing the names, figures, and positions of all the asterisms known to ancient or modern *Hindus,* not only in the Zodiac, but in both hemispheres, and almost from pole to pole. That work I translated with attention, and immediately consigned it to Mr. *Davis,* who, of all men living, is the best qualified to exhibit a copious and accurate History of *Indian* Astronomy.

DISCOURSE THE ELEVENTH,

ON THE

PHILOSOPHY OF THE ASIATICS.

Delivered 20th of February, 1794.

BY THE PRESIDENT.

HAD it been of any importance, Gentlemen, to arrange these Anniversary Dissertations according to the ordinary progress of the human mind, in the gradual expansion of its three most considerable powers, *memory*, *imagination*, and *reason*, I should certainly have presented you with an essay on the *liberal arts* of the five *Asiatic* nations, before I produced my remarks on their *abstract sciences;* because, from my own observation at least, it seems evident that *fancy*, or the faculty of combining our ideas agreeably, by various modes of imitation and substitution, is in general earlier exercised, and sooner attains maturity than the power of separating and comparing those ideas by the laborious exertions of intellect; and hence, I believe, it has happened, that all nations in the world had poets before they had mere philosophers: but, as *M. D'Alembert* has deliberately placed science before art, as the question of precedence is on this occasion of no moment whatever, and

as many new facts on the subject of *Asiatic* Philosophy are fresh in my remembrance, I propose to address you now on the sciences of *Asia*, reserving for our next annual meeting a disquisition concerning those fine arts which have immemorially been cultivated, with different success, and in very different modes, within the circle of our common inquiries.

By science I mean an assemblage of transcendental propositions discoverable by human reason, and reducible to first principles, axioms, or maxims, from which they may all be derived in a regular succession: and there are consequently as many sciences as there are general objects of our intellectual powers. When man first exerts those powers, his objects are *himself* and the rest of *nature*. Himself he perceives to be composed of *body* and *mind;* and in his *individual* capacity he reasons on the *uses* of his animal frame and of its parts, both exterior and internal; on the *disorders* impeding the regular functions of those parts, and on the most probable methods of preventing those disorders, or of removing them; he soon feels the close connexion between his corporeal and mental faculties: and when his *mind* is reflected on itself, he discourses on its *essence* and its *operations:* in his *social* character, he analyzes his various *duties* and *rights*, both private and public; and in the leisure which the fullest discharge of those duties always admits, his intellect is directed to *nature* at large, to the *substance* of natural bodies, to their several *properties*, and to their quantity both separate and united, finite and infinite; from all which objects he deduces notions, either purely abstract and universal, or mixed with undoubted facts; he argues from phenomena to theorems, from those theorems to other phenomena; from causes to effects, from effects to causes, and thus arrives at the demonstration of a *First Intelligent Cause:* whence his collected wisdom, being

arranged in the form of science, chiefly consists of *physiology* and *medicine*, *metaphysics* and *logic*, *ethics* and *jurisprudence*, *natural philosophy* and *mathematics*; from which the *religion of nature* (since revealed religion must be referred to *history*, as alone affording evidence of it) has in all ages and in all nations been the sublime and consoling result. Without professing to have given a logical definition of science, or to have exhibited a perfect enumeration of its objects, I shall confine myself to those *five* divisions of *Asiatic* Philosophy; enlarging, for the most part, on the progress which the *Hindûs* have made in them, and occasionally introducing the sciences of the *Arabs* and *Persians*, the *Tartars* and the *Chinese:* but, how extensive soever may be the range which I have chosen, I shall beware of exhausting your patience with tedious discussions, and of exceeding those limits which the occasion of our present meeting has necessarily prescribed.

I. The first article affords little scope; since I have no evidence that, in any language of *Asia*, there exists one original treatise on medicine considered as a *science:* physic, indeed, appears in these regions to have been from time immemorial, as we see it practised at this day by *Hindus* and *Mussulmans*, a mere empirical *history* of diseases and remedies; useful I admit, in a high degree, and worthy of attentive examination, but wholly foreign to the subject before us. Though the *Arabs*, however, have chiefly followed the *Greeks* in this branch of knowledge, and have themselves been implicitly followed by other *Mohammedan* writers, yet (not to mention the *Chinese*, of whose medical works I can at present say nothing with confidence) we still have access to a number of *Sanscrit* books on the old *Indian* practice of physic, from which, if the *Hindus* had a theoretical system, we might easily collect it. The

Ayurvéda, supposed to be the work of a celestial physician, is almost entirely lost, unfortunately, perhaps, for the curious *European*, but happily for the patient *Hindu*; since a revealed science precludes improvement from experience, to which that of medicine ought, above all others, to be left perpetually open: but I have myself met with curious fragments of that primeval work; and, in the *Véda* itself, I found with astonishment an entire *Upanishad* on the internal parts of the human body; with an enumeration of the nerves, veins, and arteries; a description of the heart, spleen, and liver; and various disquisitions on the formation and growth of the fœtus. From the laws, indeed, of *Menu*, which have lately appeared in our own language, we may perceive that the ancient *Hindus* were fond of reasoning, in their way, on the mysteries of animal generation, and on the comparative influence of the sexes in the production of perfect offspring; and we may collect from the authorities adduced in the learned Essay on *Egypt* and the *Nile*, that their physiological disputes led to violent schisms in religion, and even to bloody wars. On the whole, we cannot expect to acquire many valuable truths from an examination of eastern books on the science of medicine; but examine them we must, if we wish to complete the history of universal philosophy, and to supply the scholars of *Europe* with authentic materials for an account of the opinions anciently formed on this head by the philosophers of *Asia*. To know indeed, with certainty, that so much and no more can be known on any branch of science, would in itself be very important and useful knowledge, if it had no other effect than to check the boundless curiosity of mankind, and to fix them in the straight path of attainable science, especially of such as relates to their duties, and may conduce to their happiness.

II. We have an ample field in the next division, and a field almost wholly new, since the metaphysics and logic of the *Bráhmins*, comprised in their *six* philosophical *Sástras*, and explained by numerous glosses, or comments, have never yet been accessible to *Europeans;* and, by the help of the *Sanscrit* language we may now read the works of the *Saugatus*, *Bauddhas*, *Arhatas*, *Jainas*, and other heterodox philosophers, whence we may gather the metaphysical tenets prevalent in *China* and *Japan*, in the eastern peninsula of *India*, and in many considerable nations of *Tartary*. There are also some valuable tracts on these branches of science, in *Persian* and *Arabic*, partly copied from the *Greeks*, and partly comprising the doctrines of the *Súf'is*, which anciently prevailed, and still prevail in a great measure over this oriental world; and which the *Greeks* themselves condescended to borrow from eastern sages.

The little treatise in four chapters, ascribed to *Vyása*, is the only philosophical *Sástra*, the original text of which I have had leisure to peruse with a *Bráhmin* of the *Védánta* school: it is extremely obscure, and though composed in sentences elegantly modulated, has more resemblance to a table of contents, or an accurate summary, than to a regular systematical tract; but all its obscurity has been cleared by the labour of the very judicious and most learned *Sancara*, whose commentary on the *Vedánta* which I read also with great attention, not only elucidates every word of the text, but exhibits a perspicuous account of all other *Indian* schools, from that of *Capila* to those of the more modern heretics. It is not possible, indeed, to speak with too much applause of so excellent a work; and I am confident in asserting, that, until an accurate translation of it shall appear in some *European* language, the general history of philosophy must remain incom-

plete; for I perfectly agree with those who are of opinion, that one correct version of any celebrated *Hindu* book would be of greater value than all the dissertations or essays that could be composed on the same subject. You will not, however, expect that, in such a discourse as I am now delivering, I should expatiate on the diversity of *Indian* philosophical schools, on the several founders of them, on the doctrines which they respectively taught, or on their many disciples, who dissented from their instructors in some particular points. On the present occasion, it will be sufficient to say, that the oldest head of a sect, whose entire work is preserved, was (according to some authors) *Capila;* not the divine personage, a reputed grandson of *Brahmá*, to whom *Crishna* compares himself in the *Gítá;* but a sage of his name, who invented the *San'chya*, or *Numeral* philosophy, which *Crishna* himself appears to impugn in his conversation with *Arjuna;* and which, as far as I can collect it from a few original texts, resembled in part the metaphysics of Pythagoras, and in part the theology of *Zeno*. His doctrines were enforced and illustrated, with some additions, by the venerable *Patanjali*, who has also left us a fine comment on the grammatical rules of *Pánini*, which are more obscure, without a gloss, than the darkest oracle; and here, by the way, let me add, that I refer to metaphysics the curious and important science of *universal grammar*, on which many subtile disquisitions may be found interspersed in the particular grammars of the ancient *Hindus*, and in those of the more modern *Arabs*. The next founder, I believe, of a philosophical school was *Gótama;* if, indeed, he was not the most ancient of all; for his wife *Ahalyá* was, according to *Indian* legends, restored to a human shape by the great *Ráma;* and a sage of his name, whom we have no reason to suppose a different personage, is frequently mentioned in the *Véda* itself: to his rational doctrines

those of *Canáda* were in general conformable; and the philosophy of them both is usually called *Nyáya*, or *logical:* a title aptly bestowed; for it seems to be a system of metaphysics and logic better accommodated than any other anciently known in *India*, to the natural reason and common sense of mankind, admitting the actual existence of *material substance* in the popular acceptation of the word *matter;* and comprising not only a body of sublime dialectics, but an artificial method of reasoning, with distinct names for the three parts of a proposition, and even for those of a regular syllogism. Here I cannot refrain from introducing a singular tradition, which prevailed, according to the well-informed author of the *Dabistán*, in the *Panjáb* and in several *Persian* provinces; that, "among other *Indian* curiosities, "which *Callisthenes* transmitted to his uncle, was "*a technical system of logic*, which the *Bráhmins* "had communicated to the inquisitive *Greek*," and which the *Mohammedan* writer supposes to have been the ground-work of the famous *Aristotelian* method. If this be true, it is one of the most interesting facts that I have met with in *Asia:* and if it be false, it is very extraordinary that such a story should have been fabricated either by the candid *Monshani Fání*, or by the simple *Pársís* and *Pandits*, with whom he had conversed; but, not having had leisure to study the *Nyáya Sástra*, I can only assure you, that I have frequently seen perfect syllogisms in the philosophical writings of the *Bráhmins*, and have often heard them used in their verbal controversies. Whatever might have been the merit or age of *Gotama*, yet the most celebrated *Indian* school is that, with which I began, founded by *Vyása*, and supported in most respects by his pupil *Jaimini*, whose dissent on a few points is mentioned by his master with respectful moderation: their several systems are frequently distinguished by the names of the first and

second *Mínánsá;* a word which, like *Nyáya*, denotes the operations and conclusions of reason; but the tract of *Vyásа* has in general the appellation of *Védánta*, or the scope and end of the *Véda;* on the texts of which, as they were understood by the philosopher who collected them, his doctrines are principally grounded. The fundamental tenet of the *Védánta* school, to which in a more modern age the incomparable *Sancara* was a firm and illustrious adherent, consisted not in denying the existence of matter, that is of solidity, impenetrability, and extended figure (to deny which would be lunacy) but, in correcting the popular notion of it, and in contending that it has no essence independent of mental perception; that existence and perceptibility are convertible terms; that external appearances and sensations are illusory, and would vanish into nothing, if the divine energy, which alone sustains them, were suspended but for a moment: an opinion, which *Epicharmus* and *Plato* seem to have adopted, and which has been maintained in the present century with great elegance, but with little public applause; partly because it has been misunderstood, and partly because it has been misapplied by the false reasoning of some unpopular writers, who are said to have disbelieved in the moral attributes of *God*, whose omnipresence, wisdom, and goodness, are the basis of the *Indian* philosophy. I have not sufficient evidence on the subject to profess a belief in the doctrine of the *Védánta*, which human reason alone could, perhaps, neither fully demonstrate, nor fully disprove; but it is manifest, that nothing can be farther removed from impiety than a system wholly built on the purest devotion; and the inexpressible difficulty which any man, who shall make the attempt, will assuredly find in giving a satisfactory definition of *material substance*, must induce us to deliberate with coolness, before we censure the learned

and pious restorer of the ancient *Véda;* though we cannot but admit, that, if the common opinions of mankind *be* the criterion of philosophical truth, we must adhere to the system of *Gótama*, which the *Brahmins* of this province almost universally follow.

If the metaphysics of the *Védántis* be wild and erroneous, the pupils of *Buddha* have run, it is asserted, into an error diametrically opposite; for they are charged with denying the existence of pure spirit, and with believing nothing absolutely and really to exist but *material substance:* a heavy accusation which ought only to have been made on positive and incontestible proof, especially by the orthodox *Brahmins*, who, as *Buddha* dissented from their ancestors in regard to *bloody sacrifices*, which the *Véda* certainly prescribes, may not unjustly be suspected of low and interested malignity. Though I cannot credit the charge, yet I am unable to prove it entirely false, having only read a few pages of a *Saugata* book, which Captain *Kirkpatrick* had lately the kindness to give me; but it begins, like other *Hindu* books, with the word *Om*, which we know to be a symbol of the divine attributes; then follows, indeed, a mysterious hymn to the Goddess of Nature by the name of *Aryá*, but with several other titles, which the *Brahmins* themselves continually bestow on their *Dévì*. Now the *Brahmins*, who have no idea that any such personage exists as *Dévì*, or the *Goddess*, and only mean to express allegorically the *power* of *God*, exerted in creating, preserving, and renovating this universe, we cannot with justice infer, that the dissenters admit no Deity but *visible nature*. The *Pandit* who now attends me, and who told *Mr. Wilkins* that the *Saugatas* were atheists, would not have attempted to resist the decisive evidence of the contrary, which appears in the very instrument on which he was consulted, if his under-

standing had not been blinded by the intolerant zeal of a mercenary priesthood. A literal version of the book just mentioned (if any studious man had learning and industry equal to the task) would be an inestimable treasure to the compiler of such a history as that of the laborious *Brucker*. But let us proceed to the *morals* and *jurisprudence* of the *Asiatics*, on which I could expatiate, if the occasion admitted a full discussion of the subject, with correctness and confidence.

III. That both ethics and abstract law might be reduced to the *method of science*, cannot surely be doubted; but, although such a method would be of infinite use in a system of universal, or even of national jurisprudence, yet the *principles* of morality are so few, so luminous, and so ready to present themselves on every occasion, that the practical utility of a scientifical arrangement, in a treatise on ethics, may very justly be questioned. The moralists of the east have, in general, chosen to deliver their precepts in short sententious maxims, to illustrate them by sprightly comparisons, or to inculcate them in the very ancient form of agreeable apologues. There are indeed, both in *Arabic* and *Persian*, philosophical tracts, on ethics, written with sound ratiocination and elegant perspicuity; but in every part of this eastern world, from *Pekin* to *Damascus*, the popular teachers of moral wisdom have immemorially been poets, and there would be no end of enumerating their works, which are still extant in the five principal languages of *Asia*. Our divine religion, the truth of which (if any history be true) is abundantly proved by historical evidence, has no need of such aids as many are willing to give it, by asserting, that the wisest men of this world were ignorant of the two great maxims, that *we must act in respect of others as we should wish them to act in respect of*

ourselves, and that *instead* of *returning evil for evil, we should confer benefits, even on those who injure us:* but the first rule is implied in a speech of *Lysias*, and expressed in distinct phrases by *Thales* and *Pittacus;* and I have even seen it, word for word, in the original of *Confucius*, which I carefully compared with the *Latin* translation. It has been usual with zealous men to ridicule and abuse all those who dare on this point to quote the *Chinese* philosopher; but, instead of supporting their cause, they would shake it, if it could be shaken, by their uncandid asperity; for they ought to remember, that one great end of revelation, as it is most expressly declared, was not to instruct the wise and few, but the many and unenlightened. If the conversion, therefore, of the *Pandits* and *Maulavis* in this country shall ever be attempted by Protestant missionaries, they must beware of asserting, while they teach the gospel of truth, what those *Pandits* and *Maulavis* would know to be false. The former would cite the beautiful *Aryá* couplet, which was written at least three centuries before our æra, and which pronounces the duty of a good man, even in the moment of his destruction, to consist *not only in forgiving, but even in a desire of benefiting, his destroyer, as the* Sandal *tree, in the instant of its overthrow, sheds perfume on the axe which fells it;* and the latter would triumph in repeating the verse of *Sadi*, who represents *a return of good for good as a slight reciprocity;* but says to the virtuous man, "*Confer benefits on him who has injured thee;*" using an *Arabic* sentence, and a maxim apparently of the ancient *Arabs*. Nor would the *Mussulmans* fail to recite four distichs of *Háfiz*, who has illustrated that maxim with fanciful but elegant allusions:

Learn from yon orient shell to love thy foe,
And store with pearls the hand that brings thee woe:
Free, like yon rock, from base vindictive pride,
Emblaze with gems the wrist that rends thy side:

Mark, where yon tree rewards the stony show'r:
With fruit nectareous, or the balmy flow'r:
All nature calls aloud: "*shall man do less*
"*Than heal the smiter, and the railer bless?*"

Now there is not a shadow of reason for believing that the poet of *Shiraz* had borrowed this doctrine from the *Christians;* but, as the cause of *Christianity* could never be promoted by falsehood or error, so it will never be obstructed by candour and veracity; for the lessons of *Confucius* and *Chanacya*, of *Sadi* and *Háfiz*, are unknown even at this day to millions of *Chinese* and *Hindus*, *Persians*, and other *Mahommedans*, who toil for their daily support; nor, were they known ever so perfectly, would they have a divine sanction with the multitude; so that, in order to enlighten the minds of the ignorant, and to enforce the obedience of the perverse, it is evident, *a priori*, that a revealed religion was necessary in the great system of Providence: but my principal motive for introducing this topic, was to give you a specimen of that ancient oriental morality which is comprised in an infinite number of *Persian*, *Arabic*, and *Sanscrit* compositions.

Nearly one half of *jurisprudence* is closely connected with ethics; but, since the learned of *Asia* consider most of their laws as positive and divine institutions, and not as the mere conclusions of human reason; and since I have prepared a mass of extremely curious materials which I reserve for an introduction to the digest of *Indian* laws, I proceed to the fourth division; which consists principally of *sciences* transcendently so named, or *the knowledge of abstract quantities, of their limits, properties, and relations*, impressed on the understanding with the force of irresistible *demonstration;* which, as all other knowledge depends, at best, on our fallible senses, and in a great

measure on still more fallible testimony, can only be found in pure mental abstractions; though for all the purposes of life, our own senses, and even the credible testimony of others, give us, in most cases, the highest degree of certainty, physical and moral.

IV. I have already had occasion to touch on the *Indian* metaphysics of *natural bodies*, according to the most celebrated of the *Asiatic* schools, from which the *Pythagoreans* are supposed to have borrowed many of their opinions; and, as we learn from *Cicero*, that the old sages of *Europe* had an idea of *centripetal force*, and a principle of *universal gravitation* (which they never indeed attempted to demonstrate) so I can venture to affirm, without meaning to pluck a leaf from the never-fading laurels of our immortal *Newton*, that the whole of his theology, and part of his philosophy, may be found in the *Védas*, and even in the works of the *Súfis*. The *most subtil spirit*, which he suspected to pervade natural bodies, and, lying concealed in them, to cause attraction and repulsion; the emission, reflection, and refraction of light; electricity, calefaction, sensation, and muscular motion, is described by the *Hindus* as a *fifth element*, endued with those very powers; and the *Védas* abound with allusions to a force universally attractive, which they chiefly ascribe to the Sun, thence called *Aditya*, or the *Attractor:* a name designed by the mythologists to mean the Child of the Goddess *Aditi;* but the most wonderful passage on the theory of attraction, occurs in the charming allegorical poem of *Shírín* and *Ferhád*, or the *Divine Spirit* and *a human soul disinterestedly pious:* a work which, from the first verse to the last, is a blaze of religious and poetical fire. The whole passage appears to me so curious, that I make no apology for giving you a faithful translation of it:

" There is a strong propensity which dances through
" every atom, and attracts the minutest particle to
" some particular object. Search this universe from
" its base to its summit, from fire to air, from water
" to earth, from all below the Moon to all above
" the celestial spheres, and thou wilt not find a cor-
" puscle destitute of that natural attractibility; the
" very point of the first thread in this apparently
" tangled skein, is no other than such a principle of
" attraction; and all principles beside are void of
" a real basis: from such a propensity arises every
" motion perceived in heavenly, or in terrestrial
" bodies: it is a disposition to be attracted, which
" taught hard steel to rush from its place and rivet
" itself on the magnet: it is the same disposition
" which impels the light straw to attach itself firmly
" on amber: it is this quality which gives every
" substance in nature a tendency toward another,
" and an inclination forcibly directed to a determi-
" nate point." These notions are vague, indeed, and unsatisfactory; but permit me to ask, whether the last paragraph of *Newton's* incomparable work goes much farther? and whether any subsequent experiments have thrown light on a subject so abstruse and obscure? That the sublime astronomy and exquisitely beautiful geometry with which that work is illumined, should in any degree be approached by the Mathematicians of *Asia*, while of all *Europeans* who ever lived, *Archimedes* alone was capable of emulating them, would be a vain expectation; but we must suspend our opinion of *Indian* astronomical knowledge till the *Súrya Siddhánta* shall appear in our own language, and even then (to adopt a phrase of *Cicero*) our *greedy and capacious ears* will by no means be satisfied; for, in order to complete an historical account of genuine *Hindu* astronomy, we require verbal translations of at least three other *Sanscrit* books; of the treatise of *Parasara* for

the first age of *Indian* science; of that by *Varáha*, with the copious comment of his very learned son, for the middle age; and of those written by *Bhascara* for times comparatively modern. The valuable and now accessible works of the last mentioned philosopher, contain also an *universal*, or *specious* arithmetic, with one chapter at least in geometry; nor would it, surely, be difficult to procure, through our several residents with the *Pishwá* and with *Scindhya*, the older books on algebra, which *Bhascara* mentions, and on which Mr. *Davis* would justly set a very high value; but the *Sanscrit* work, from which we might expect the most ample and important information, is entitled *Cshétrádersa*, or *a View of Geometrical Knowledge*, and was compiled in a very large volume, by order of the illustrious *Jayasinha*, comprising all that remains on that science in the sacred language of *India:* it was inspected in the west by a *Pandit* now in the service of Lieutenant *Wilford*, and might, I am persuaded, be purchased at *Jayanagar*, where Colonel *Polier* had permission from the *Rájá* to buy the four *Vedas* themselves. Thus have I answered, to the best of my power, the three first questions obligingly transmitted to us by Professor *Playfair*,---Whether the *Hindus* have books in *Sanscrit* expressly on geometry? Whether they have any such on arithmetic? and, Whether a translation of the *Súryha Siddhánta* be not the great *desideratum* on the subject of *Indian* astronomy? To his three last questions,---Whether an accurate summary account of all the *Sanscrit* works on that subject? A delineation of the *Indian* celestial sphere, with correct remarks on it? and, A description of the astronomical instruments used by the ancient *Hindus*, would not severally be of great utility? we cannot but answer in the affirmative, provided that the utmost critical sagacity were applied in distinguishing such works,

constellations, and instruments, as are clearly of *Indian* origin, from such as were introduced into this country by *Mussulman* astronomers from *Tartary* and *Persia*, or in later days by mathematicians from *Europe*.

V. From all the properties of man and of nature, from all the various branches of science, from all the deductions of human reason, the general corollary, admitted by *Hindus*, *Arabs*, and *Tartars*, by *Persians*, and by *Chinese*, is the supremacy of an all-creating and all-preserving Spirit, infinitely wise, good, and powerful, but infinitely removed from the comprehension of his most exalted creatures; nor are there in any language (the ancient *Hebrew* always excepted) more pious and sublime addresses to the Being of beings, more splendid enumerations of his attributes, or more beautiful descriptions of his visible works, than in *Arabic*, *Persian*, and *Sanscrit*, especially in the *Koran*, the introductions of the poems of *Sadi*, *Nizámí*, and *Firdausi*, the four *Vèdás* and many parts of the numerous *Puránas*: but supplication and praise would not satisfy the boundless imagination of the *Vedánta* and *Súfi* theologists, who, blending uncertain metaphysics with undoubted principles of religion, have presumed to reason confidently on the very nature and essence of the divine spirit, and asserted in a very remote age, what multitudes of *Hindus* and *Mussulmans* assert at this hour, that all spirit is homogeneous; that the spirit of *God* is in *kind* the same with that of man, though differing from it infinitely in *degree*; and that, as material substance is mere illusion, there exists in this universe only one generic spiritual sustance, the sole primary cause, efficient, substantial, and formal, of all secondary causes and of all appearances whatever, but endued, in its highest degree, with a sublime providential wisdom,

an proceeding by ways incomprehensible to the spi which emane from it: an opinion which *Gótama* never taught, and which we have no authority to believe, but which, as it is grounded on the doctrine of an immaterial Creator supremely wise, and a constant Preserver supremely benevolent, differs as widely from the pantheism of *Spinoza* and *Toland* as the affirmation of a proposition differs from the negociation of it; though the last-named professor of that *insane philosophy* had the baseness to conceal his meaning under the very words of Saint *Paul*, which are cited by *Newton* for a purpose totally different, and has even used a phrase which occurs, indeed, in the *Vèda*, but in a sense diametrically opposite to that which he would have given it. The passage to which I allude, is in a speech of *Varuna* to his son, where he says, "That spirit, from which these created "beings proceed; through which, having proceeded "from it, they live; toward which they tend, and "in which they are ultimately absorbed,—that spirit "study to know; that spirit is the Great One."

The subject of this discourse, Gentlemen, is inexhaustible: it has been my endeavour to say as much on it as possible in the fewest words; and, at the beginning of next year, I hope to close these general disquisitions with topics measureless in extent, but less abstruse than that which has this day been discussed; and better adapted to the gaiety which seems to have prevailed in the learned banquets of the *Greeks*, and which ought surely to prevail in every symposiac assembly.

A DISCOURSE

Delivered at

A MEETING OF THE ASIATIC SOCIETY,

ON THE 22D OF MAY, 1794.

BY SIR JOHN SHORE, BART. PRESIDENT.

IF I had consulted my competency only, for the station which your choice has conferred upon me, I must, without hesitation, have declined the honour of being the President of this Society; and although I most cheerfully accept your invitation, with every inclination to assist, as far as my abilities extend, in promoting the laudable views of our association, I must still retain the consciousness of those disqualifications, which you have been pleased to overlook.

It was lately our boast to possess a President, whose name, talents, and character, would have been honourable to any institution; it is now our misfortune to lament, that Sir *William Jones* exists but in the affections of his friends, and in the esteem, veneration, and regret of all.

I cannot, I flatter myself, offer a more grateful tribute to the Society, than by making his character

the subject of my first address to you; and if in the delineation of it, fondness or affection for the man should appear blended with my reverence for his genius and abilities, in the sympathy of your feelings I shall find my apology.

To define, with accuracy, the variety, value, and extent of his literary attainments, requires more learning than I pretend to possess; and I am therefore to solicit your indulgence for an imperfect sketch, rather than expect your approbation for a complete description, of the talents and knowledge of your late and lamented President.

I shall begin with mentioning his wonderful capacity for the acquisition of languages, which has never been excelled. In *Greek* and *Roman* literature, his early proficiency was the subject of admiration and applause; and knowledge, of whatever nature, once obtained by him, was ever afterwards progressive. The more elegant dialects of modern *Europe*, the *French*, the *Spanish*, and the *Italian*, he spoke and wrote with the greatest fluency and precision; and the *German* and *Portuguese* were familiar to him. At an early period of life his application to oriental literature commenced: he studied the *Hebrew* with ease and success; and many of the most learned *Asiatics* have the candour to avow, that his knowledge of *Arabic* and *Persian* was as accurate and extensive as their own; he was also conversant in the *Turkish* idiom; and the *Chinese* had even attracted his notice so far, as to induce him to learn the radical characters of that language, with a view, perhaps, to further improvements. It was to be expected, after his arrival in *India*, that he would eagerly embrace the opportunity of making himself master of the *Sanscrit*; and the most enlightened professors of the doctrines of *Brahma*, confess, with pride, de-

light, and surprise, that his knowledge of their sacred dialect was most critically correct and profound. The *Pandits*, who were in the habit of attending him, when I saw them after his death, at a public *Durbar*, could neither suppress their tears for his loss, nor find terms to express their admiration at the wonderful progress he had made in their sciences.

Before the expiration of his twenty-second year, he had completed his Commentaries on the Poetry of the *Asiatics*; although a considerable time afterwards elapsed before their publication; and this work, if no other monument of his labours existed, would at once furnish proofs of his consummate skill in the oriental dialects, of his proficiency in those of *Rome* and *Greece*, of taste and erudition far beyond his years, and of talents and application without example.

But the judgment of Sir *William Jones* was too discerning to consider language in any other light than as the key of science; and he would have despised the reputation of a mere linguist. Knowledge and truth were the objects of all his studies, and his ambition was to be useful to mankind. With these views, he extended his researches to all languages, nations, and times.

Such were the motives that induced him to propose to the government of this country, what he justly denominated a work of national utility and importance; the compilation of a copious Digest of *Hindu* and *Mohammedan* Law, from *Sanscrit* and *Arabic* originals, with an offer of his services to superintend the compilation, and with a promise to translate it. He had foreseen, previous to his departure from *Europe*, that without the aid of such a work, the wise and benevolent intentions of the legislature of *Great Britain*, in leaving, to a certain extent, the na-

tives of these provinces in possession of their own laws, could not be completely fulfilled; and his experience, after a short residence in *India*, confirmed what his sagacity had anticipated, that without principles to refer to, in a language familiar to the judges of the courts, adjudications amongst the natives must too often be subject to an uncertain and erroneous exposition, or wilful misinterpretation of their laws.

To the superintendence of this work, which was immediately undertaken at his suggestion, he assiduously devoted those hours which he could spare from his professional duties. After tracing the plan of the digest, he prescribed its arrangement and mode of execution, and selected from the most learned *Hindus* and *Mohammedans* fit persons for the task of compiling it. Flattered by his attention, and encouraged by his applause, the *Pandits* prosecuted their labours with cheerful zeal, to a satisfactory conclusion. The *Moluvees* have also nearly finished their portion of the work; but we must ever regret that the promised translation, as well as the meditated preliminary dissertation, have been frustrated by that decree which so often intercepts the performance of human purposes.

During the course of this compilation, and as an auxiliary to it, he was led to study the works of *Menu*, reputed by the *Hindus* to be the oldest and holiest of legislators; and finding them to comprise a system of religious and civil duties, and of law in all its branches, so comprehensive and minutely exact, that it might be considered as the institutes of *Hindu* law, he presented a translation of them to the Government of *Bengal*. During the same period, deeming no labour excessive or superfluous that tended, in any respect, to promote the welfare or happiness of mankind, he gave the public an *English* version of the *Arabic* text of the *Sirájiyyah*, or *Mo-*

Mahammedan Law of inheritance, with a Commentary: He had already published in *England*, a translation of a tract on the same subject, by another *Mohammedan* lawyer, containing, as his own words express, a lively and elegant epitome of the Law of Inheritance, according to *Zaid*.

To these learned and important works, so far out of the road of amusement, nothing could have engaged his application but that desire which he ever professed, of rendering his knowledge useful to his own nation, and beneficial to the inhabitants of these provinces.

Without attending to the chronological order of their publication, I shall briefly recapitulate his other performances in *Asiatic* Literature, as far as my knowledge and recollection of them extend.

The vanity and petulance of *Anquetil du Perron*, with his illiberal reflections on some of the learned Members of the University of *Oxford*, extorted from him a letter in the *French* language, which has been admired for accurate criticism, just satire, and elegant composition. A regard for the literary reputation of his country, induced him to translate from a *Persian* original into *French*, the Life of *Nadir Shah*, that it might not be carried out of *England*, with a reflection that no person had been found in the *British* dominions capable of translating it. The students of *Persian* literature must ever be grateful to him for a grammar of that language, in which he has shewn the possibility of combining taste and elegance with the precision of a grammarian; and every admirer of *Arabic* poetry must acknowledge his obligations to him for an *English* version of the seven celebrated poems, so well known by the name of *Moallakat*, from the distinction to which their excellence had entitled them

of being suspended in the temple of *Mecca*. I should scarcely think it of importance to mention, that he did not disdain the office of Editor of a *Sanscrit* and *Persian* work, if it did not afford me an opportunity of adding, that the latter was published at his own expense, and was sold for the benefit of insolvent debtors. A similar application was made of the produce of the *Sirajiyyah*.

Of his lighter productions, the elegant amusements of his leisure hours, comprehending hymns on the *Hindu* mythology; poems, consisting chiefly of translations from the *Asiatic* languages; and the version of *Sacontala*, an ancient *Indian* drama,—it would be unbecoming to speak in a style of importance which he did not himself annex to them. They shew the activity of a vigorous mind, its fertility, its genius, and its taste. Nor shall I particularly dwell on the discourses addressed to this Society, which we have all perused or heard, or on the other learned and interesting dissertations, which form so large and valuable a portion of the records of our researches; let us lament that the spirit which dictated them is to us extinct; and that the voice to which we listened with improvement and rapture, will be heard by us no more.

But I cannot pass over a paper, which has fallen into my possession since his demise, in the handwriting of Sir *William Jones* himself, entitled *Desiderata*, as more explanatory than any thing I can say of the comprehensive views of his enlightened mind. It contains, as a perusal of it will shew, whatever is most curious, important, and attainable, in the sciences and histories of *India*, *Arabia*, *China*, and *Tartary*; subjects which he had already most amply discussed in the disquisitions which he laid before the Society.

DESIDERATA.

INDIA.

I.

The Ancient Geography of *India*, &c. from the *Purânas*.

II.

A Botanical Description of *Indian* Plants, from the *Cóshas*, &c.

III.

A Grammar of the *Sanscrit* Language, from *Pánini*, &c.

IV.

A Dictionary of the *Sanscrit* Language, from thirty-two original Vocabularies and *Niructi*.

V.

On the Ancient Music of the *Indians*.

VI.

On the Medical Substances of *India*, and the *Indian* Art of Medicine.

VII.

On the Philosophy of the Ancient *Indians*.

VIII.

A Translation of the *Véda*.

IX.

On Ancient *Indian* Geometry, Astronomy, and Algebra.

X.

A Translation of the *Purânas*.

XI.

Translations of the *Mahábharat Rámáyan.*

XII.

On the *Indian* Theatre, &c. &c.

XIII.

On the *Indian Constellations*, with their Mythology, from the *Puránas.*

XIV.

The History of *India* before the *Mohammedan* Conquest. From the *Sanscrit-Cashmír* Histories.

ARABIA.

XV.

The History of *Arabia* before *Mohammed.*

XVI.

A Translation of the *Hámasa.*

XVII.

A Translation of *Harírí.*

XVIII.

A Translation of the *Fáchatúl Khulafá.*
Of the *Cáfiah.*

PERSIA.

XIX.

The History of *Persia*, from Authorities in *Sanscrit. Arabic, Greek, Turkish, Persian*, ancient and modern.
Firdaufi's-Khosrau náma.

XX.

The five Poems of *Nizámi*, translated in prose.
A Dictionary of pure *Persian. Jehangire.*

CHINA.

XXI.

A Translation of the *Shi-cing*.

XXII.

The Text of *Can-fu-tsu* verbally translated.

TARTARY.

XXIII.

A History of the *Tartar* Nations, chiefly of the *Moguls* and *Othmans*, from the *Turkish* and *Persian*.

We are not authorised to conclude that he had himself formed a determination to complete the works which his genius and knowledge had thus sketched; the task seems to require a period beyond the probable duration of any human life; but we who had the happiness to know Sir *William Jones*, who were witnesses of his indefatigable perseverance in the pursuit of knowledge, and of his ardour to accomplish whatever he deemed important, who saw the extent of his intellectual powers, his wonderful attainments in literature and science, and the facility with which all his compositions were made, cannot doubt, if it had pleased Providence to protract the date of his existence, that he would have ably executed much of what he had so extensively planned.

I have hitherto principally confined my discourse to the pursuits of our late President, in oriental literature, which, from their extent, might appear to have occupied all his time; but they neither precluded his attention to professional studies, nor to science in general. Amongst his publications in *Europe*, in polite literature, exclusive of various compositions in prose and verse, I find a translation of the Speeches of *Isæus*, with a learned comment; and in law, an Essay on the Law of Bailments. Upon the subject of

this last work, I cannot deny myself the gratification of quoting the sentiments of a celebrated historian:—"Sir *William Jones* has given an ingenious and rational Essay on the Law of Bailments. He is perhaps the only lawyer equally conversant with the year-books of *Westminster*, the Commentaries of *Ulpian*, the Attic Pleadings of *Isæus*, and the Sentences of *Arabian* and *Persian Cadhis*."

His professional studies did not commence before his twenty-second year: and I have his own authority for asserting, that the first book of *English* jurisprudence which he ever studied, was *Fortescue's* Essay, in Praise of the Laws of *England*.

Of the ability and conscientious integrity with which he discharged the functions of a Magistrate, and the duties of a Judge of the Supreme Court of Judicature, in this settlement, the public voice and public regret bear ample and merited testimony. The same penetration which marked his scientific researches, distinguished his legal investigations and decisions; and he deemed no inquiries burthensome which had for their object substantial justice under the rules of law.

His addresses to the jurors are no less distinguished for philanthropy and liberality of sentiment, than for just expositions of the law, perspicuity and elegance of diction; and his oratory was as captivating as his arguments were convincing.

In an epilogue to his Commentaries on *Asiatic* Poetry, he bids farewell to polite literature, without relinquishing his affection for it; and concludes with an intimation of his intention to study law, expressed in a wish which we now know to have been prophetic,

Mihi sit oro, non inutilis toga,
Nec indiserta lingua, nec turpis manus!

I have already enumerated attainments and works which, from their diversity and extent, seem far beyond the capacity of the most enlarged minds; but the catalogue may yet be augmented. To a proficiency in the languages of *Greece*, *Rome*, and *Asia*, he added the knowledge of the philosophy of those countries, and of every thing curious and valuable that had been taught in them. The doctrines of the *Academy*, the *Lyceum*, or the *Portico*, were not more familiar to him than the tenets of the *Vèdas*, the mysticism of the *Sufis*, or the religion of the ancient *Persians;* and whilst with a kindred genius he perused with rapture the heroic, lyric, or moral compositions of the most renowned poets of *Greece*, *Rome*, and *Asia*, he could turn with equal delight and knowledge to the sublime speculations, or mathematical calculations of *Barrow* and *Newton*. With them also he professed his conviction of the truth of the *Christian* religion; and he justly deemed it no inconsiderable advantage that his researches had corroborated the multiplied evidence of revelation, by confirming the *Mosaic* account of the primitive world. We all recollect, and can refer to the following sentiments in his Eighth Anniversary Discourse.

"Theological inquiries are no part of my present subject; but I cannot refrain from adding, "that the collection of tracts, which we call from "their excellence the Scriptures, contain, independently of a divine origin, more true sublimity, "more exquisite beauty, purer morality, more important history, and finer strains both of poetry and "eloquence, than could be collected within the same "compass from all other books that were ever composed in any age, or in any idiom. The two parts, of which the scriptures consist, are connected by a chain of compositions, which bear no resemblance in form or style to any that can be produced

" from the stores of *Grecian*, *Indian*, *Persian*, or even " *Arabian* learning. The antiquity of those compo- " sitions no man doubts, and the unrestrained appli- " cation of them to events long subsequent to their " publication, is a solid ground of belief that they " were genuine predictions, and consequently inspired."

There were, in truth, few sciences in which he had not acquired considerable proficiency; in most his knowledge was profound. The theory of music was familiar to him, nor had he neglected to make himself acquainted with the interesting discoveries lately made in Chemistry: and I have heard him assert, that his admiration of the structure of the human frame, had induced him to attend for a season to a course of anatomical lectures, delivered by his friend the celebrated *Hunter*.

His last and favourite pursuit was the study of *Botany*, which he originally began under the confinement of a severe and lingering disorder; which, with most minds, would have proved a disqualification from any application. It constituted the principal amusement of his leisure hours. In the arrangements of *Linnæus* he discovered system, truth, and science, which never failed to captivate and engage his attention; and, from the proofs which he has exhibited of his progress in *Botany*, we may conclude that he would have extended the discoveries in that science. The last composition which he read in this Society, was a description of select *Indian* plants: and I hope his Executors will allow us to fulfil his intention of publishing it in a number of our Researches.

It cannot be deemed useless or superfluous to inquire, by what arts or method he was enabled to attain to a degree of knowledge, almost universal, and apparently beyond the powers of man, during a life little exceeding forty-seven years.

The faculties of his mind, by nature vigorous, were improved by constant exercise: and his memory, by habitual practice, had acquired a capacity of retaining whatever had once been impressed upon it. To an unextinguished ardour for universal knowledge, he joined a perseverance in the pursuit of it, which subdued all obstacles; his studies began with the dawn, and, during the intermissions of professional duties, were continued throughout the day; reflection and meditation strengthened and confirmed what industry and investigation had accumulated. It was a fixed principle with him, from which he never voluntarily deviated, not to be deterred by any difficulties that were surmountable, from prosecuting to a successful termination what he had once deliberately undertaken.

But what appears to me more particularly to have enabled him to employ his talents so much to his own and the public advantage, was the regular allotment of his time to particular occupations, and a scrupulous adherence to the distribution which he had fixed; hence, all his studies were pursued without interruption or confusion: nor can I here omit remarking, what may probably have attracted your observation as well as mine, the candour and complacency with which he gave his attention to all persons, of whatever quality, talents, or education: he justly concluded that curious or important information might be gained even from the illiterate; and wherever it was to be obtained, he sought and seized it.

Of the private and social virtues of our lamented President, our hearts are the best records. To you who knew him, it cannot be necessary for me to expatiate on the independence of his integrity, his humanity, probity, or benevolence, which every living creature participated; on the affability of his conver-

sation and manners, or his modest unassuming deportment; nor need I remark that he was totally free from pedantry, as well as from arrogance and self-sufficiency, which sometimes accompany and disgrace the greatest abilities: his presence was the delight of every society, which his conversation exhilarated and improved; and the public have not only to lament the loss of his talents and abilities, but that of his example.

To him, as the Founder of our Institution, and whilst he lived, its firmest support, our reverence is more particularly due: instructed, animated, and encouraged by him, genius was called forth into exertion, and modest merit was excited to distinguish itself. Anxious for the reputation of the Society, he was indefatigable in his own endeavours to promote it, whilst he cheerfully assisted those of others. In losing him, we have not only been deprived of our brightest ornament, but of a guide and patron, on whose instructions, judgment, and candour, we could implicitly rely.

But it will, I trust, be long, very long, before the remembrance of his virtues, his genius, and abilities, lose that influence over the Members of this Society which his living example had maintained; and if, previous to his demise, he had been asked, by what posthumous honours or attentions we could best shew our respect for his memory, I may venture to assert he would have replied, "by exerting yourselves to support the credit of the Society;" applying to it, perhaps, the dying wish of Father PAUL, "Esto perpetua."

[To front page 189.]

A SYNOPSIS OF THE DIURNAL AND SEPTENARY CHANGES OF THE BAROMETER.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
A. M.		29.97	29.89	29.93			29.97	30. 2		29.89	29.86	29.85	29.79	29.86	29.81		29.83		29.91			29.78	29.84	29.81				29.82		29.83	
	I	.97	.87	.93	29.85	29.94		. 2	29.85	.87		.83	.78	.84	.89	3.92			.91	29.99		.78	.84	.85	29.85				29.84	.83	
	II	.97	.97		.82			. 0	.94		.86	.83							.88			.78	.84			.84	29.81		.84	.83	
	III	.98				.94		. 0		.86		.83		.83			.83			.88	29.80	.78		.83		.84	.81				
	IV	.98				.93						.83	.78	.83	.89	.90					.79				.85	.84		.81	.84	.83	29.80
	V	.98	.97	.91		.92	.94												.88				.80	.85	.88						.80
	VI	.98				.92	.94				.84						.85	29.79		.88				.85	.88		.81	.81				.80
	VII	.98	.97			.92	.94																								
	VIII	.93	.97	.92	.93	.91	.94	29.98	.92		.83	.83				.88		.79	.88	.87	.79	.78		.85	.88			.81				.80
	IX	.93		.92	.93			.93			.83			.83	.89			.79													.80
	X	.93	.97	.92			.94	.98	.92	.86			.79			.85	.84	.79				.79		.83	.88		.84	.81		.86	.83	.80
	XI		.97			.94			.92		.83	.83		.84	.85	.84			.85	.86	.78			.85		.88		.83	.88	.83	.80
	XII		.97		.83	.94	.96	30. 1		.88	.83		.79	.87	.93	.88	.84		.88	.86	.81			.87	.92		.83	.86				
P. M.				.92	.88	.94	.98	. 2	.94	.90		.83	.81	.88	.94	.89	.83		.90	.88		.79	.84	.88				.88	.90	.84	.80
	I		30. 1		.88	.93	.98	. 3	.92	.88	.85	.83	.83	.85	.87	.87	.84		.96	.88	.85	.82			.94		.87		.93		
	II		. 2	.91			.98		.93	.90	.85	.83	.83	.86	.87	.90	.84	.83	.98	.88	.89	.83	.88	.90		.92		.90	.93	.85	.86	.80
	III		. 2		.90	.93		. 4	.95			.87		.90	.94	.84			.98		.87		.88		.97	.92	.89	.92	.93	.86	.82
	IV		. 3																												
	V		. 3	.90	.93		29. 1	. 4	.96		.92	.82	.88	.96	.96	.94	.84	.86	.99	.90		.85	.89		.92		.90		.94	.87	.82
	VI		. 4	.94	.93	29.		. 4			.93	.82	.88	.92	.90	.94	.84	.86	.95	.90	.88	.85	.89	.94	.89	.93		.93		.94	.87	
	VII		. 4	.94	.93	29.	. 1	. 4				.82	.88	.92	.90	.93	.84		.95	.90	.89	.85	.89				.93		.94	.87	.83
	VIII		. 4	.94	.94	30.	. 1	. 5	.96	.93	.93	.81	.88	.92	.89	.93	.84	.86	.93	.88			.89	.93	.98		.90	.92	.94	.87	.83
	IX		. 4	.94	.94	29.	. 1	. 5	.96	.93	.93	.81	.90	.92	29.98	.95	.84	.86	.95	.87	.83		.89	.94	.96	.93	.90	.92	.94	.86	
	X		. 4	.94	.94	30.	. 1		.93		.79	.80		.92	.97	.93	.84	.86			.83	.86	.87	.94		.90				.93	.82
	XII		. 2	.94	.94	30.	. 1	. 1	.93		.87	.80	.90	.90	.94	.93	.84	.80	.87	.83		.86	.87	.92	.96	.89		.90		.85		
P. M.			30.		.94		29.89	30. 1	.93	.89		.86		.89	.93		.84	.84	.81		.81		.85		.90	.91	.87		.90			.80
	I	30.		29.92		29.96	.87	29.99	.93		29.84	.79	.86	.89	.93	.93	.84	.82	.92	.82		.82	.83						.83		
	II	29.99	29.97		.90	.94	.87	.93	.91	.86	.85	.78	.84	.87	.92	.93	.84	.81	.88	.82	29.81	.80	.82	.90		.85	.84	.86	.83	.83	.80
	III	.97	.96	.91	.90	.94		.94	.89	.86	.83	.77	.82	.87	.90	.93	.83	.80	.88	.82	.79		.82			.83	.82	.83	.83	.81	.80
	IV	.97	.93	.91	.89	.93	.96	.94	.89	.83	.83	.77	.82	.85	.90	.93		.80		.82	.79	.80	.80	.90	.90	.83	.81	.87	.83	.81	
	V	.96	.94	.88	.88	.92	.94	.92	.89	.83	.83	.77	.82	.84	.88	.93		.80	.86	.82	.80	.79	.79	.88	.88	.83	.81	.81	.83	.81	.80
	VI	.96	.93	.88	.88	.89	.94	.91		.83	.83	.78	.84	.84	.88	.93		.80		.82	.79	.79	.79	.87	.83		.81	.81	.83	.81	
	VII	.96	.93	.86	.88	.89	.94	.91		.83	.84	.78	.82	.84	.88	.93	.92	.80		.82	.78	.79	.79	.83	.85	.81	.81	.81	.83	.81	.80
	VIII	.96	.93	.86		.89	.94	.91	.84	.83	.84	.78	.82	.84	.88	.93	.91	.80		.82	.78	.79	.79	.83	.85	.81	.81	.81	.83		
	IX	.96	.93	.86		.89	.94	.91	.84	.83	.84	.78	.82	.84	.88	.93	.91	.80		.82	.78	.79	.79	.83	.85	.81	.81	.81	.83		
	X	.96	.93	.86		.89	.94	.91	.84	.83	.84	.78	.82	.84	.88	.93	.91	.80		.82	.78	.79	.79	.83	.85	.81	.81	.81	.83		
	XI	.96	.93	.86		.89	.94	.91	.84	.83	.84	.78	.82	.84	.88	.93	.91	.80		.82	.78	.79	.79	.83	.85	.81	.81	.81	.83		
	XII	.96	.93	.86		.89	.94	.91	.84	.83	.84	.78	.82	.84	.88	.93	.91	.80		.82	.78	.79	.79	.83	.85	.81	.81	.81	.83		

CALCUTTA. { New Moon, March 31 — 1 h. 16 m. P. M. / First Quarter, April 7 — 11 h. 15 m. A. M. / Full Moon, April 15 — 4 h. 0 m. P.M. } Last Quarter, April 23 — 6 h. 42 m. P. M. / New Moon, April 29 — 9 h. 53 m. P. M. } 1794.

A

TREATISE ON THE BAROMETER.

BY FRANCIS BALFOUR, ESQ.

I.

IN a Treatise, published at this place a few weeks ago, on Sol-Lunar Influence in Fevers, I have endeavoured to shew, "*That all Fevers are liable to certain diurnal and septenary* revolutions; and that these revolutions are uniformly and constantly connected with fixed periods of time.*

II.

Having established this proposition (I.) it was natural to suppose that the power or influence which is capable of producing these very remarkable and interesting revolutions on the human constitution, at certain intervals, did not exert itself without effecting, at the same time, some corresponding periodical change in the state of that element in which we constantly exist; and in which all the operations of life and nature are carried on.

Other necessary avocations having hitherto prevented me from being able to make those experiments myself that are required for deciding on this

* That is to say, changes happening after an interval of seven or eight days.

question, I applied to Mr. *Farquhar*, who, I understood, had paid some attention to this subject; and was favoured with the following very obliging and instructive letter:

TO DOCTOR BALFOUR.

DEAR SIR,

" You likewise desire me to give you some account of the regular diurnal variations of the Barometer which take place in this country; and which, I said, I conceived to be peculiar to tropical climates, from the otherwise unaccountable silence of every author whose work I had been able to consult on the subject. The first intimation of this was from Mr. *Henry Trail*, who informed me that he had observed the Mercury to rise every night till about eleven o'clock, when it became stationary. I immediately repeated his observations, and found that the fact was certain; but that there was likewise another diurnal variation, which had escaped his notice. After numerous observations, at all hours during the day and night, I found that the Mercury is subject to the following variations, with the utmost degree of regularity, throughout the whole year. From six in the morning till between seven and eight, it is stationary; it then rises till nine, sometimes, though rarely, till ten, when it remains stationary till noon; it then descends, and is lowest at three, and continues stationary till eight; when it begins to rise, and continues till eleven, and is then at the same height that it was at nine in the morning.

On relating the above observations to the late Colonel *Pearce*, an indefatigable and rigidly accurate observer, and who had devoted much time and attention to Barometrical pursuits, he was surprised that such regular variations of the Mercury should have

escaped his observation: but some time after, with great candour acknowledged the certainty of the fact, and framed an hypothesis to account for it; which you will probably be able to obtain on an application to Captain *Grace*.

To me the phenomena appear inexplicable by any hypothesis that I can think of. The periods are evidently connected with the earth's diurnal motion; and, if he had not a satellite, might be easily explained by the atmospherical tides caused by the sun. But when we find that the Barometer is not, in the least observable degree, affected by the moon's passage over the meridian, or by the united action of the sun and moon at the syzygies, we have absolute proof that this cannot be the cause; neither can the expansion of the Mercury, being directly opposite to the phenomena, the greatest degree of heat taking place at three o'clock, when the Mercury is lowest.

With respect to the influence of the moon on the atmosphere, I was perfectly satisfied while in *Beerboom*, that the cold season set in at the syzygies only; and that there was always a considerable increase of cold at every return of them. But at the old powder-works near *Calcutta*, I observed the greatest degree of cold to happen sometimes at the quadratures. Being, however, at that time much engaged in other pursuits, I did not attend to the circumstance of the moon's *absolute distance*, though of the utmost consequence in all calculations of the heights of the tide, to which the variations of the state of the atmosphere, occasioned by the attraction of the sun and moon, must be analogous. And yet this fact, important as it is to every sea-faring person, especially in river-navigation, as well as to ship-builders, for predicting the highest spring-tides, seems to be totally unknown to the generality of these persons; nor is it surprising, as it is

not taken notice of in any treatise on navigation that I have met with. But M. *De la Lande* (Astronomy, vol. iii. p. 656) shews, that if the moon's mean force to raise the waters of the ocean be two and a half, her greatest force when *apogee*, will be three; and her least when *perigee*, two: a difference sufficient to account for the tides at the quadratures being sometimes nearly as high as those at the syzygies: a circumstance which was ascertained by part of a committee instituted for examining plans for new powder-works at the Old Fort Ghaut; where stakes had been driven, on purpose to find the rise of the tide. M. *de la Lande* confirms the theory by many observations, made with great accuracy in some of the ports of France (Supplement, vol. iv.); and I can vouch for the fact by numerous measures of the heights of the tide, both at the old and new powder-works. But you may easily satisfy yourself of the fact, by observing the height of a few tides at Champaul Gaut, when you will find, invariably, that every great parallax of the moon, at the syzygies, is attended with a very high tide and strong bore; and *vice versa*. I have not been able to observe that the moon's declination, notwithstanding what you may have heard from other quarters, has any perceptible effect on the tides.

I have been the more particular on this subject, as I have heard it made an unanswerable objection to your system, that the first attacks of intermittent fever do happen at the quadratures as well as the syzygies; and that relapses do likewise happen at the quadratures. Now, should you meet with any such cases, the above observations may perhaps tend to reconcile them to your system, &c.

JOHN FARQUHAR.

Banky Bazar, 12th Feb. 1794.

III.

Although in this letter *Mr. Farquhar* describes in the Barometer only *three* different diurnal periods of rising and falling, I could not help suspecting that there must likewise be a *fourth*, which had escaped his notice; and that I should be able to discover a periodical falling also in the state of the mercury, between eleven at night and six in the morning, analogous to that which he had observed between eleven at mid-day and six in the evening. Accordingly, by keeping myself awake, and continuing my observations during the night, I have now the satisfaction to be assured that my anticipation of the revolution I expected to discover, was perfectly just.

IV.

With a view of ascertaining the progress of these *four* different revolutions by personal observation, I imposed upon myself the task of observing and recording the changes of the Barometer, as far as I was able, every half-hour, day and night, during the period of one complete lunation.

The result of this undertaking I have now the honour to lay before the Society; and if in matter or form it contains any thing worthy of their attention, or of a place amongst their Researches, it will afford me a degree of satisfaction that will more than reward me for my labour.

I. *OF THE PERIODICAL DIURNAL CHANGES* OF THE BAROMETER.

THE DETAIL OF FACTS.

V.

The Detail of Facts is comprehended in the following record of observations made on the *Barometer*, as regularly as I was able to perform it, every half-hour, both day and night, during the lunation which intervened between the 31st of *March* and the 29th of *April*, 1794. To these I have added the state of the *Thermometer* and *Wind*, with the *appearance* of the sky.

VI.

My observations of the *Barometer* were taken with scrupulous exactness; and although the weighty hand of sleep has more than once deprived me of observations that I was just about to make, and was anxious to record, I have never ventured to assume any probable state of the Mercury as an actual observation.

VII.

With respect to the *Thermometer*, although it was liable to some inaccuracy, from my not being able to preserve the apartment in which it was hung, uniformly open or shut, yet, as the variations from this cause were trifling, and never obscured the regular and progressive rise and fall which it observes at different periods of the day, I conceive that my record is sufficiently exact for enabling me to decide, with safety, that the daily fluctuations which appeared in the Ba-

rometer, were *not* connected with the daily vicissitudes of heat and cold.

VIII.

Although the state of the *wind* was not measured by any instrument, but estimated only grossly by the effect which it appeared to produce on the trees and other objects around, still I conceive that I may also venture to determine on this ground, that the diurnal fluctuation of the Mercury was *not* connected with the state of the wind.

In the column appropriated for recording the state of the wind, *Number* 1 represents a breeze capable of carrying on a ship two or three miles in an hour; *Number* 2, a breeze capable of carrying on a ship four or five miles; and *Number* 3, a breeze capable of carrying on a ship six, seven, or eight miles.

IX.

Neither are the *appearances of the sky* defined with much precision or minuteness; yet, upon the description that I have given, I think I may pronounce with sufficient confidence, that they did *not* direct or regulate the periodical diurnal fluctuation of the Barometer.

By conceiving the wind, which in the month of *April* is generally from some point in the south, carrying constantly along with it, in the different degrees of velocity I have described (VIII.) different proportions of light and heavy clouds, we may obtain a tolerably just idea of the appearance of the sky at *Calcutta* during that month.

To express these different states, we have employed in the record, the terms *clear*, *cloudy*, and *overcast*.

When few clouds only appear, or none, which is seldom the case this season, the sky is said to be *clear*; when the sun or stars shine through a number of clouds, the sky is said to be *cloudy*, and when the sun or stars do not appear at all, the sky is said to be *overcast*.

N.B. As the record of observations from which these negative propositions (VII. VIII. IX.) respecting the *thermometer*, *the state of the wind*, and *appearance of the sky* are inferred, is voluminous, and would necessarily exclude from this volume of the Researches matter that is much more interesting, it has been considered sufficient for the object of this paper, to insert only the opposite abstract, or *Synopsis*, of the observations made on the Barometer.

THE STATEMENT.

XI.

The sum of my observations respecting the four Periodical Diurnal Revolutions of the Barometer which I have described, appears at one view in the preceding Synoptical Arrangement, and when stated precisely in numbers, amounts to this:—

1*st*, That on every day of the thirty comprehended in the Record, excepting one *(a)*, the Barometer constantly *fell* between ten at night and six in the morning; and that progressively, and without any intermediate rising, excepting in one instance *(b)*.

2*d*, That on every day of the thirty comprehended in the Record, without one exception,

(*a*) Between the 20th and 21st—*Vide* Synopsis.
(*b*) Between the 22d and 23d—ditto.

the Barometer constantly *rose* between six and ten in the morning; and that progressively, and without any intermediate falling, excepting in two instances *(c) (d)*.

3d, That on every day of the thirty comprehended in the Record, without one exception, the Barometer constantly *fell* between ten in the morning and six in the evening; and that progressively, and without any intermediate rising in any instance.

4th, That on every day of the thirty comprehended in the Record, excepting two *(e) (f)*, the Barometer constantly *rose* between six and ten in the evening; and that progressively, and without any intermediate falling in any instance.

THE INFERENCE.

XII.

From the preceding statement of the coincidences observed in these four portions of the day, it appears that we reasonably infer the following propositions, limited to *Calcutta* in the month of *April* 1794.

1st, That, in the interval between ten at night and six in the morning, there existed a *prevailing tendency* in the Mercury to *fall*.

(c) On the 11th, - —*Vide* Synopsis.
(d) On the 23d, - —ditto.
(e) On the 15th, - —ditto.
(f) On the 20th, - —ditto.

2*d*, That, in the interval between six and ten in the morning, there existed a *prevailing tendency* in the Mercury to *rise*.

3*d*, That, in the interval between ten in the morning and six in the evening, there existed a *prevailing tendency* in the Mercury to *fall*.

4*th*, That, in the interval between six and ten in the evening, there existed a *prevailing tendency* in the Mercury to *rise*.

These different prevailing tendencies to rise and fall periodically at certain times of the day and night, necessarily imply a proportionate corresponding cause sufficient to produce them. But here we stop, and venture to proceed no farther than to say, with Mr. *Farquhar*, that they seem to be connected with the diurnal revolutions of the planet which we inhabit.

XIII.

By an attentive examination of the Synopsis, it will appear that the general characters of the tendencies which prevail at the different periods we have described, are liable, within their respective limits, to several remarkable *variations*.

1. With regard to *the time of beginning* to rise or fall.
2. With regard to *the time of ceasing* to rise or fall.
3. With regard to *the steps or degrees* by which the Mercury rises or falls.
4. With regard to the *limits or extremes* to which it rises or falls.

Being under the necessity of acknowledging our ignorance of the cause which produces these *prevail-*

ing tendencies themselves, we can of course have no adequate idea or conception in theory of the different circumstances that are capable of producing the different *variations* which appear in their general character; and our observations being much too limited to establish, concerning them, any like thing practical rules, we must remain contented for the present with pointing them out as questions which want investigation; expressing however a strong suspicion that they are not unconnected with the relative positions of the Moon and the other planets.

THE APPLICATION.

XIV.

At the time of digesting the ideas which I have delivered upon this subject, being possessed of no information but that which was communicated in Mr. *Farquhar's* letter, and what I obtained afterwards from my own observations, I did not conceive that I was authorised to extend the propositions which I have advanced (XII.) respecting these tendencies, beyond the limits of *Calcutta*. By a note, however, which is just now pointed out to me in Dr. *Moseley's* very ingenious Treatise on Tropical Diseases *(a)*, I have the satisfaction to find that the very same tendencies have been observed to prevail

(*a*) The Note referred to in Dr. *Moseley's* Treatise is this:— "It has been observed in these and more equatorial regions, that "though the Barometer is useless in indicating the variations of the "weather, it exhibits a phenomenon not correctly ascertained in "temperate climates; which is, that the Mercury has two diurnal "motions of ascent and descent, of nearly a line, corresponding "with the course of the sun; ascending as the sun approaches the "zenith and nadir, and descending as the sun deviates from these "points. It remains stationary at its lowest and highest degrees for "some hours."

on the opposite side of the globe. We may therefore now venture to allow them a more extensive range; and it will, no doubt, be considered of some importance to establish in certain latitudes *(b)* the existence of a law in nature by which the Mercury of the Barometer, let the standing weight and pressure of the atmosphere be what it may, is liable to the effects of a constant and regular periodical diurnal fluctuation; for it will then follow *that* the power of each succeeding hour to raise or sink it, is liable to differ from that which went before; that the height of the Mercury, therefore, taken only at two or three stated hours of the day, cannot with propriety be assumed to represent or form a just estimate of the whole twenty-four; *that* calculations proceeding hitherto on such partial grounds, must necessarily include error and require adjustment; and *that* in future, wherever this law extends, no correct philosophical investigation connected with the nature of the atmosphere, can be carried on without giving it a place *(c)*; and no *just prognostic* formed of the weather

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(b) As far as I can judge from the following extract from Father *Cotte's* Memoir on the prevailing winds, &c. &c. which I have just met with in the *Edinburgh Magazine* for *March* 1792, there seems to be great reason to believe that similar fluctuations take place in the Mercury, in the different latitudes of *Europe;* and that they are not entirely confined to the regions under the equator.

"The Mercury is generally a little lower about two o'clock in "the afternoon than at any other time of the day; and it is highest towards eight o'clock at night. I would compare this fact "without pretending to draw any consequences from it, with the "phenomenon of the magnetic needle, the greatest variation of "which from north towards west takes place about two or three "in the afternoon, and the least about eight o'clock in the morning.—Vide *the Edinburgh Magazine* for *March* 1792, page 214, par. 6.

(c) A mean, extracted from means obtained from the extremes of these different diurnal fluctuations, will give the mean weight of the atmosphere much more correctly than the common process.

without distinguishing those regular and constant changes from such as are only occasional and temporary.

With respect to Medicine, this law is a principle entirely new; and it has now become a matter of real consequence, to ascertain in what respects it co-operates with the power of the sun and moon in producing and regulating the paroxysms of fevers. From the striking coincidence of *these tendencies* with the periods at which the paroxysms of fevers generally attack and remit, and from their superior prevalence in tropical climates where the paroxysms of fevers are also most prevalent, "*it seems to be highly probable that they may have a considerable share in constituting that power which shews itself in so remarkable a manner in this country, and which we have denominated Sol-Lunar Influence.*"

II. OF THE PERIODICAL SEPTENARY CHANGES OF THE BAROMETER.

XV.

Respecting periodical septenary changes in the state of the Barometer, the only information I have been able to obtain, is extracted from an abridged Exposition of the System of Mr. *Toaldo* upon the probability of the change of weather by the lunar points taken from the *Journal des Sciences Utiles*, and published in the *Calcutta Magazine* for *July* and *August* 1793. Mr. *Toaldo*, it appears, in order to ascertain whether the moon had any influence on the

Mercury, collected a journal of the Barometer kept for several years, from which he discovered that the Barometer was six-tenths of a line higher at the times of the quadratures than at the syzygies.

If this journal was kept correctly on a proper plan, periodical septenary changes in the Barometer connected with the revolutions of the moon, are established of course. *But* if it was kept in the ordinary way of assuming two or three observations taken in the course of the day, to serve as a standard or rule for estimating the state of the whole twenty-four, it is evidently *liable to* errors, which render the calculation precarious and inconclusive for the reasons already explained, which however had not occurred to me at the time of writing my last Treatise on Sol-Lunar Influence.

That the Barometer will be differently affected at the springs and neaps, is an anticipation which has in its favour the strongest probability that analogy can afford. Yet, upon a review of the observations collected during the springs and neaps of the lunation which I have observed, I cannot say that, when arranged as they stand in the Synopsis, in coincidence with their respective periods, they exhibit a difference of character to establish this conclusion. We therefore leave it to the decision of a far more extensive experience, conducting its observations on a plan similar to that which we have exemplified in this Treatise.

In looking over Dr. Moseley's *Treatise on this occasion, I am sorry to discover that, trusting too much to memory, in referring to his work in my last publication, I have given a very imperfect account of what he has communicated on the subject of Sol-Lunar Influence. But when he considers that by my inaccuracy I have deprived myself of the weight of his authority, in supporting a proposition I was anxious to establish, he will be inclined to ascribe it to the cause I have stated. Dr.* Moseley's *observations are contained in the* Conclusion *to his Treatise, between page 550 and 556: they confirm the power of Sol-Lunar Influence in Europe in a very unequivocal manner, and merit the attention of those who wish for information on this subject.---For the note to which this remark refers,* vide *page* 212.

ON THE DUTIES

OF

A FAITHFUL HINDU WIDOW.

BY HENRY COLEBROOKE, ESQ.

WHILE the light which the labours of the *Asiatic Society* have thrown on the sciences and religion of the *Hindus*, has drawn the attention of the literary world to that subject, the hint thrown out by the President for rejecting the authority of every publication preceding the translation of the *Gitá*, does not appear to have made sufficient impression. Several late compilations in *Europe* betray great want of judgment in the selection of authorities; and their motley dress of true and false colours tends to perpetuate error; for this reason it seems necessary on every topic, to revert to original authorities for the purpose of recalling error or verifying facts already published; and this object will no way be more readily attained than by the communication of detached essays on each topic, as it may present itself to the Orientalist in the progress of his researches.

From this or any other motive for indulgence, should the following authorities from *Sanscrit* books be thought worthy of a place in the next volume of the Society's Transactions, I shall be rewarded for the pains taken in collecting them.

" Having first bathed, the widow, dressed in two " clean garments, and holding some *cúsá* grass, sips " water from the palm of her hand. Bearing *cúsá* " and *tila (a)* on her hand, she looks towards the " east or north while the *Bráhmana* utters the mystic " word *Om*. Bowing to *Nerayana*, she next declares " *(b)* " On this month, so named in such a *Pacsha*, " on such a *tit'hi*, I (naming herself and her *(c)* " family) that I may meet *Arundhatí (d)* and re- " side in *Swarga;* that the years of my stay may be " numerous as the hairs on the human body; that I " may enjoy with my husband the felicity of hea- " ven, and sanctify my paternal and maternal pro- " genitors, and the ancestry of my husband's fa- " ther; that lauded by the *Apsarases*, I may be hap- " py with my lord, through the reigns of fourteen " *Indras;* that expiation be made for my husband's " offences, whether he has killed a *Bráhmana*, " broken the ties of gratitude, or murdered his friend, " thus I ascend my husband's burning pile. I call " on you, ye guardians of the eight regions of the " world; Sun and Moon! Air, Fire, Æther *(e)*, " Earth, and Water! My own soul! *Yama!* Day, " Night, and Twilight! And thou, Conscience, bear

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(*a*) *Sesamum.*

(*b*) This declaration is called the *Sancalpa.*

(*c*) *Gótra*, the family or race. Four great families of *Bráhmanas* are now extant, and have branched into many distinct races. Since the memorable massacre of the *Cshatriyàs*, by *Parasú Ráma*, the *Cshatriyàs* describe themselves from the same *Gótras* as the *Bráhmanas.*

(*d*) Wife of *Vasisht'ha.*

(*e*) *Acàsa.*

" witness: I follow my husband's corpse on the fu-
" neral pile *(f)*."

Having repeated the *Sancalpa*, she walks thrice round the pile; and the *Bráhmana* utters the following *Mantras:*

" Om! Let these women, not to be widowed
" good wives, adorned with collyrium, holding cla-
" rified butter, consign themselves to the fire. Im-
" mortal, not childless, nor husbandless, excellent,
" let them pass into fire, whose original element is
" water.

From the *Rigvéda.*

" Om! Let these wives, pure, beautiful, commit
" themselves to the fire, with their husband's corpse."

A Pauránica Mantra.

With this benediction, and uttering the mystic *Namó Namah*, she ascends the flaming pile.

While the prescribed ceremonies are performed by the widow, the son, or other near kinsman, of the deceased, applies the first torch, with the forms

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(f) In several publications the woman has been described as placing herself on the pile before it be lighted; but the ritual quoted is conformable to the text of the *Bhàgavata.*

" When the corpse is about to be consumed in the *Sahótaja**, the faithful wife who stood without, rushes on the fire."

Náreda to Yudisht'hira.

* Cabin of grass or leaves, sometimes erected on the funeral pile. " The shed on the funeral pile of a *Muní* is called *Parn'ótaja* and *Sahótaja.*" See the vocabulary entitled *Hárábalí.*

directed for funeral rites in the *Grìhya (g)*; by which his tribe is governed.

The *Sancalpa* is evidently formed on the words of *Angiras*:

"The wife who commits herself to the flames with her husband's corpse, shall equal *Arundhatî*, and reside in *Swarga*;

"Accompanying her husband, she shall reside so "long in *Swarga* as are the thirty-five millions of "hairs on the human body.

"As the snake-catcher forcibly drags the serpent "from his earth, so, bearing her husband from "hell, with him she shall enjoy heavenly bliss.

"Dying with her husband, she sanctifies her ma- "ternal and paternal ancestors; and, the ancestry of "him to whom she gave her virginity.

"Such a wife, adoring her husband, in celestial "felicity with him, greatest, most admired *(h)*; "with him she shall enjoy the delights of heaven "while fourteen *Indras* reign.

(*g*) Extracts or compilations from the sacred books, containing the particular forms for religious ceremonies, to be observed by the race or family for whom that portion of the sacred writings has been adopted, which composes their *Grìhya*. We learn from the *Bhágavata*, that *Vyása* divided the *Véda* into four (*Rich*, *Yajush*, *Sáman*, and *Atharvan*) or five, including the *Itihàsas* or other *Puránas* as one *Véda*. *Paila* accepted the *Rigvéda*; *Jaimeni* and *Cavi*, or *Sucra*, the *Sámavéda*; *Baisampayana* learned the *Rajurvéda*; *Sumantu*, *Daruna*, and others of the family of *Angiras*, the *Atharvavéda*. "My father (*Suc'ha*, son of *Vyása*, speaks) selected the *Itihàsas* and "*Puránas*; then the several *Ríshis* chose the *Védas* variously (parts "of each). Their pupils, the successors of their pupils, and the "pupils of these, became followers of particular *Sác'has*."

(*h*) The word in the text is expounded "lauded by the choir of heaven, *Gandharvas*," &c.

" Though her husband had killed a *Bráhmana*, " *(i)* broken the ties of gratitude, or murdered his " friend, she expiates the crime." *Anigras.*

The *Mantras* are adopted on the authority of the *Brahme Purana.*

" While the pile is preparing, tell the faithful " wife of the greatest duty of woman; *she is loyal and* " *pure who burns herself with her husband's corpse.* " Hearing this, fortified in her resolution, and full " of affection, she completes the *Pitrímheda Yaga* " *(k)* and ascends to *Swarga.*"

Brahme Purana.

It is held to be the duty of a widow to burn herself with her husband's corpse; but she has the alternative,

" On the death of her husband, to live as *Brah-* " *machàrì*, or commit herself to the flames."

Vishnu.

The austerity intended consists in chastity, and in acts of piety and mortification.

" The use of *Tambúli*, dress, and feeding off ves- " sels of tutenague is forbidden to the *Yati (l)*, the " *Brahmachàrì*, and the *widow.*

Prachétas.

(*i*) The commentators are at the pains of shewing that this expiation must refer to a crime committed in a former existence; for funeral rites are refused to the murderer of a *Bráhmana.*

(*k*) Act of burning herself with her husband.

(*l*) *Sannyasì.*

" The widow shall never exceed one meal a day, " nor sleep on a bed; if she does so, her husband falls " from *Swarga*.

" She shall eat no other than simple food, and " *(m)* shall daily offer the *tarpana* of *cúsa*, *tila*, and " water *(n)*.

" In *Vaisác'ha*, *Cártica*, and *Mágha*, she shall ex- " ceed the usual duties of ablution, alms, and pilgri- " mage, and often use the name of *God* in prayer."

The *Smríti*.

After undertaking the duty of a *Satí*, should the widow recede, she incurs the penalties of defilement.

" If the woman, regretting life, recede from the " pile, she is defiled; but may be purified by observ- " ing the fast called *Prájápatya*." *(o)*

Apastamba.

Though an alternative be allowed, the *Hindu* legislators have shown themselves disposed to encourage widows to burn themselves with their husband's corpse.

Hárita thus defines a loyal wife: " She, whose " sympathy feels the pains and joys of her husband;

(m) If she has no male descendants. See *Maitana Parijáta*.

(n) Oblations for the manes of ancestors to the third degree, though not exclusively; for the prayer includes a general petition for remoter ancestors. Yet daily oblations (*Vaisvé'va*) are separately offered for ancestors beyond the third degree.

(o) It extends to twelve days; the first three, a spare meal may be taken once in each day; the next three, one in each night, the succeeding three days, nothing may be eaten but what is given unsolicited; and the last three days are a rigid fast.

" who mourns and pines in his absence, and dies " when he dies, is a good and loyal wife."

Hárita.

" Always revere a loyal wife, as you venerate " the *Dévatás*; for, by her virtues, the prince's em- " pire may extend over the three worlds."

Matsya Purâna.

" Though the husband died unhappy by the dis- " obedience of his wife; if from motives of love, " disgust of the world, fear of living unprotected, " or sorrow, she commit herself to the flames, she " is entitled to veneration."

Mahá Bhárata.

Obsequies for suicides are forbidden; but the *Rigvèda* expressly declares, " that the loyal wife who " burns herself, shall not be deemed a suicide. When " a mourning of three days has been completed, the " *Stráddha* is to be performed*." This appears from the prayer for the occasion, directed in the *Rigvèda.*

Regularly the chief mourner for the husband and for the wife, would in many cases, be distinct persons: but the *Bhavishya Purâna* provides, *that* " When the widow consigns herself to the same " pile with the corpse of the deceased, whoever per- " forms the *Criyá* for her husband, shall perform it " for her."

" As to the ceremonies from the lighting of the " funeral pile to the *Pinda*; whoever lights the pile " shall also offer the *Pinda*." *Váyu Purâna.*

* The shortness of the mourning is honourable: the longest mourning is for the lowest tribe.

In certain circumstances the widow is disqualified for this act of a *Sati*.

" She who has an infant child, or is pregnant, or " whose pregnancy is doubtful, or who is unclean, " may not, O princess, ascend the funeral pile.

" So said *Náreda* to the mother of *Sagara*."

" The mother of an infant shall not relinquish the " care of her child to ascend the pile; nor shall one " who is unclean (from a periodical cause) or whose " time for purification after child-birth is not passed, " nor shall one who is pregnant, commit herself to the " flames *(q)*. But the mother of an infant may, if " the care of the child can be otherwise provided."
Vrihaspati.

In the event of a *Bràhmana* dying in a distant country, his widow is not permitted to burn herself.

" A *Viprà* or *Bràhmana* may not ascend a second " pile." *Gótama*.

But with other casts, this proof of fidelity is not precluded by the remote decease of the husband; and is called *Anugamana*.

" The widow, on the news of her husband's dying " in a distant country, should expeditiously burn " herself: so shall she obtain perfection." *Jésa*.

(q) It has been erroneously asserted, that a wife, pregnant at the time of her husband's death, may burn herself after delivery. *Hindu* authorities positively contradict it. In addition to the text it may be remarked, that it is a maxim, " What was prevented in " its season, may not afterwards be resumed."

" Should the husband die on a journey, holding " his *sandals* to her breast, let her pass into the flames."
Brahme Purána.

The expression is not understood of *sandals* exclusively: for thus *Usanas* or *Sucra.*

" Except a *Viprà*, the widow may take any thing " that belonged to her husband, and ascend the pile.

" But a *Viprà* may not ascend a second pile; this " practice belongs to other tribes." *Sucra.*

In two of the excepted cases, a latitude is allowed for a widow desirous of offering this token of loyalty, by postponing the obsequies of the deceased: for *Vyása* directs that, " If the loyal wife be distant " less than the journey of a day, and desire to die " with her husband, his corpse shall not be burnt " until she arrive. And the *Bhavishya Puràna* per- " mits that the corpse be kept one night, if the third " day of her uncleanness had expired when her hus- " band died."

With respect to a circumstance of time (*r*), which might on some occasions be objected, the commentators obviate the difficulty, by arguing from several texts, " that to die with or after her husband, is for " a widow *Naimittica (s)* and *Cámya (t)*, and conse- " quently allowable in the intercalary month;" for *Dacsha* teaches, that " whenever an act both *Nai-* " *mittica* and *Cámya* is in hand, it is then to be " performed without consulting season." They are at the trouble of removing another difficulty:

(*r*) Occasional observances are omitted on intercalary days.
(*s*) Eventual; incumbent when a certain event happens.
(*t*) Optional; done for its reward.

" *Dhritaráshtra*, in the state of *Samadhi*, quitted " his terrestrial form to proceed to the *Mucti*, or " *beatitude*, which awaited him. When the leaves " and wood were lighted to consume the corpse, " his wife *Gándhárí* was seen to pass into the flames. " Now also, a husband dying at *Cási* and attaining " *Mucti*, it becomes his widow to follow the corpse " in the flames."

It were superfluous to pursue commentators through all their frivolous distinctions and laborious illustrations on latent difficulties.

All the ceremonies essential to this awful rite are included in the instructions already quoted. But many practices have been introduced, though not sanctioned by any ritual. A widow who declares her resolution of burning herself with the corpse, is required to give a token of her fortitude: and it is acknowledged, that one who receded after the ceremony commenced, would be compelled by her relations to complete the sacrifice. This may explain circumstances described by some who have witnessed the melancholy scene.

Other ceremonies noticed in the relations of persons who have been present on such occasions, are directed in several rituals:

" Adorned with all jewels, decked with *minium* " and other customary ornaments, with the box of " *minium* in her hand, having made *puja*, or adoration " to the *Dévátás*, thus reflecting that this life is " *nought: my lord and master to me was all.*" she " walks round the burning pile: she bestows jewels " on the *Bráhmanas*, comforts her relations, and " shows her friends the attentions of civility; while " calling the Sun and elements to witness, she dis-

" tributes *minium* at pleasure; and having repeated
" the *Sancalpa*, proceeds into the flames: there em-
" bracing the corpse, she abandons herself to the fire,
" calling *Satya! Satya! Satya!*"

The by-standers throw on butter and wood: for this, they are taught, that they acquire merit exceeding ten millions fold, the merit of an *Aswamèdha*, or other great sacrifice. Even those who join the procession from the house of the deceased to the funeral pile, for every step are rewarded as for an *Aswamèdha*. Such *indulgences* are promised by grave authors: they are quoted in this place only as they seem to authorise an inference, that happily the martyrs of this superstition have never been numerous. It is certain that the instances of the widow's sacrifices are now rare: on this it is only necessary to appeal to the recollection of every person residing in *India*, how few instances have actually occurred within his knowledge. And, had they ever been frequent, superstition would hardly have promised its indulgences to spectators.

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY

ON THE TRACES

OF THE

HINDU LANGUAGE AND LITERATURE

Extant amongst the Malays.

BY WILLIAM MARSDEN, ESQ.

THE *Sanscrit*, or ancient language of the *Hindus*, is a subject so interesting in itself, that every discovery which contributes to throw light upon its history or to mark its extent, carries with it a degree of importance. The proofs of its influence in the northern countries of *Assam*, *Nepal*, *Booten*, and *Tibet*, as well as in the southern parts of the peninsula of *India*, are to be found in the works of the Missionaries and the Researches of this Society; but the progress it made in early times, amongst the inhabitants of the eastern islands and countries possessed by the *Malays*, has not, I believe, been pointed out by any writer. My acquaintance with the language of the latter people, together with some attention paid to the dialects of *India* in general, have enabled me to observe, that the *Malayan* is indebted to the *Sañscrit* for a considerable number of its terms. I have also satisfied myself, that the intercourse by which this communication was effected, must have taken place in times anterior, probably by many centuries,

to the conversion of these people to the *Mohammedan* religion. The language, it is true, abounds at present with *Arabic* words, which their writers affect to introduce, because this display of literary skill is, at the same time a proof of their religious knowledge; but they are generally legal or metaphysical terms, borrowed from the *Koran* and its commentaries; are never expressive of simple ideas, have not been incorporated into the language (a few excepted) and are rarely made use of in conversation. The *Hindu* words, on the contrary, are such as the progress of civilization must soon have rendered necessary, being frequently expressive of the feelings of the mind, or denoting those ordinary modes of thought which result from the social habits of mankind, or from the evils that tend to interrupt them. It is not however to be understood, that the affinity between these languages is radical, or that the names for the common objects of sense are borrowed from the *Sanscrit*. The *Malayan* is a branch or dialect of the widely extended language prevailing throughout the islands of the *Archipelago*, to which it gives name (*), and those of the *South Sea*; comprehending between *Madagascar* on the one side, and *Easter Island* on the other, both inclusive, the space of full two hundred degrees of longitude. This consideration alone is sufficient to give it claim to the highest degree of antiquity, and to originality, as far as that term can be applied. The various dialects of this speech, though they have a wonderful accordance in many essential properties, have experienced those changes which separation, time, and accident produce; and in respect to the purposes of intercourse, may be classed into several languages, differing consider-

* The *Malay-Archipelago* may be understood to comprehend the *Sunda*, *Phillippine*, and *Molucca* islands, in the maritime parts of which the *Malayan* is used as a *lingua franca*.

ably from each other. The marks of cultivation by which the *Malayan* is distinguished from his ruder neighbours, are to be attributed, in my opinion, to the effects of an early connexion that must have subsisted between the inhabitants of this eastern peninsula and those of the continent of *India;* but what the nature and circumstances of this connexion may have been, it is not easy to determine. A spirit of foreign conquest, and still more, a zeal for the propagation of their religious tenets, appear incompatible with the genius of the *Hindu* system, excepting amongst the disciples of *Bhood;* but I have never discovered in the *Malayan* customs or opinions any traces of the peculiar institutions of that extraordinary sect.

A commercial intercourse has always subsisted between the manufacturing countries of *India* and the marts for the produce of the *Spice-islands*, such as *Johor*, *Sinapoora* and *Malacca;* and when the *Portuguese*, at the commencement of the sixteenth century, first visited these places, they mention with surprise the concourse of foreign vessels assembled there. But independently of other objections that might be raised to the probability of these traders having polished the language of the people whose ports they frequented, or having imparted to them their national literature, it is to be observed that by much the greater proportion of the ships belonging to native merchants, which now enter the straits of *Malacca*, come from the coast of *Coromandel*, and consequently are navigated by persons who speak the languages prevailing in that part; whereas it is evident, that, from the *Telinga*, or the *Tamool*, the *Malayan* has not received any portion of its improvement, but from the genuine *Hindwee* of the northern provinces, prior to its debasement by the mixture of *Arabic* nouns, and the abuse of verbal auxiliaries. If

the communication must necessarily be supposed to have its origin in commerce, I should be inclined to consider the people of *Guzerat*, notwithstanding their distance, as the instructors of the *Malays*. Their resort to *Malacca* is particularly noticed by *De Barras*, and other authentic writers; and it is well known that the *Hindu* language has been preserved with more purity in that, than in any other maritime province of *India*.

The nature of the affinity suggested, will sufficiently appear to those who are conversant with the *Hindu* dialects, by the following examples of *Sanscrit* words, which are at the same time so familiar to the *Malays*, and so thoroughly incorporated into their vernacular tongue, that their foreign origin is never suspected, although the terms adopted from the *Arabs* can, with very few exceptions, be immediately pointed out by the most ordinary scholar. It is true that he is assisted in this discrimination by the peculiarities of the *Arabic* orthography; for the *Malays*, as well as the *Persians* and other people, who, in consequence of their conversion to the faith of the *Koran*, employ this alphabet in their writings, do yet reject the use of certain letters, either as superfluous, or as not suited to the smoothness of their own sounds, and which therefore appear only in words purely *Arabic*. The *Hinduvee* words, on the contrary, being divested of their proper dress, and clothed, in common with those originally *Malayan*, in the adopted *Arabic* character (with certain judicious modifications) want the same token of their origin, and are more assimilated with the rest of the language.

In this short list of words, taken, with little pains in the selection, from a *Malayan* dictionary, the departure from the *Hinduvee* is scarcely more than may arise from a different habit of spelling them in our

letters, unless where it consists in a slight variation of the sense, or of the part of speech.

Sooka, Fond, pleased.
Sooka chetha. Pleasure, joy.
Dooka. Sad.
Bagee. To divide.
Bangsa. Race, family.
Basa. Language.
Bechara. Advice, counsel, judicial proceeding.
Beejee. Seed.
Boodee. Wisdom, understanding.
Loba. Covetous.
Jaga. To watch.
Pootree. Princess.
Rata. Chariot.
Pernama. Full moon.
Charee. To seek.

An inspection of the characters used by the natives of the islands, who have not adopted the *Malayan* or *Arabic* mode of writing, will shew that in the arrangement of their letters they have taken the *Hindu* for their guide, and have even preserved the rhythmus terminated by a *nasal;* which so peculiarly distinguishes this from every other system. The aspirated letters not being required for expressing the sounds of these languages, are omitted, and each division of the series consists therefore of three, instead of five. In the *Rejang* alphabet the order is as follows: *Ka, ga, nga; Ta, da, na; Pa, ba, ma; Cha, ja, nia,* &c. (see *History of Sumatra*, plate.) In the *Sanscrit*, I need scarcely to observe, the series of consonants begins thus: *Ka, k'ha, ga, g'ha, nga; Cha, ch'ha, ja, j'ha, gnya; Ta, t'ha, da, d'ha, na,* &c. If other proofs were wanting of the influence of *Hindu* intercourse in these parts, such conformity alone, in a matter so arbitrary, and which exists equally in other obscure dialects, and extends even to the island of *Celebes*, would be sufficient to establish it. The languages of these islanders have not, however, been enriched by an accession of *Hindu* words in any degree proportioned to the *Malayan*, which uses the *Arabic* alphabet; but the probability is strong, that the inhabitants of the *Malay* peninsula were in possession of an alphabet on the same model, and were even skilled in composition, before the *Mohammedans* introduced their learning and character among them.

But the circumstance which has more immediately struck my attention, and given occasion to these remarks, is that of my having met with frequent allusion in their writings to the most celebrated works of the *Hindu* mythological poets, especially the *Mahabharat* and the *Ramayan*. A manuscript now lying before me, which is a species of romance, exhibits in almost every page the marks of the author's acquaintance with *Hindu* literature and manners. It contains the adventures of two princes, who were sent by the king their father, to obtain for him the possession of an extraordinary self-performing instrument of music, whose enchanting air he had heard in a dream. However flimsy this foundation, and incoherent the parts of its superstructure, it gives scope to the display of a lively and fertile imagination, much delicate imagery, and pathetic expression of sentiment. The following passages allude, unequivocally, to well-known personages in the *Puranas*:—*Terlaloo baeck segala roopa'nia maha indah separtee pandooa leema;* "surpassing good was their "whole appearance; most admirable, like unto the "five *Pandoos*." Again: *Lakoo'nia meng-amok eeto separtee pandooa leema tatkala eea meng-amok dedalam rayet kooraoo;* "the manner in which they "fought was like that of the five *Pandoos* when they "rushed into the ranks of the *Kooroos*." These can be no other than the renowned favourites of *Krishna*, whose brilliant actions and personal accomplishments are the theme of immortal song. The machinery of the *Ramayan* is interwoven with the story; and this circumstance tends to increase my regret that we possess no translation, even in abstract, of that much-admired poem. The *Malayan* princes are, like *Rama*, attended in their wars by apes of extraordinary endowments, who fight with more than human prowess, and overcome the *Raksasa*, or hobgoblins, who serve under the banners of the

adversary. One of the former, whose talents as an ambassador are the subject of panegyric, is said to resemble that diplomatic monkey who was sent by *Sree Rama* to the King of *Langkapooree*. The mixture of qualities and actions gravely attributed to them in their double capacity of monkies and heroes, produces a very ludicrous and amusing effect. Though their ideas are rational, their manners and propensities are faithful to nature. Mention is also made of *Bisno dewa;* of the mountain *Maha meroo;* of the blue lotos growing in the pool *Mandoo ratna;* of a lion possessing supernatural powers, *Sing-asaktee*, and elsewhere *Sing-a-rajoon*, who shot arrows at *Maharaja Karna*. Some of these latter names I do not recollect to have met with in the notices we have of the *Hindu* mythology.

These similies and allusions must refer, as in all poetry, to stories with which the readers were presumed to be well acquainted, and seem to imply, that translations of the works were formerly in the hands of the *Malays*. I do not know that such remain amongst them at this day: but my ignorance is no proof of the contrary; for at the time when I had opportunities of making the inquiry, I was uninformed as to the existence of the originals, and the passages above quoted were of course unintelligible to me. They must be sought for in the peninsula of *Malacca*, or amongst the *Menangkabon* people in *Sumatra*. A spirit of investigation is now gone forth, and under the influence of the *Asiatic Society;* and from the example of its President, we may confidently hope that no region of oriental literature will be left unexplored.

Since the foregoing Paper was written, and communicated to a few friends, I have seen a copy of the third volume of the *Asiatic Researches* (just

received from Calcutta) and observe that the connexion between the *Malayan* and the *Sanscrit* has not escaped the notice of the President, whose learned and elegant *Anniversary Discourse* points it out (p. 11 and 12) in a clear and decided manner. The sanction of his authority to my opinion fully reconciles me to the anticipation of a supposed discovery.

A

CATALOGUE

OF

INDIAN PLANTS,

Comprehending

THEIR SANSCRIT, AND AS MANY OF THEIR LINNÆAN GENERIC NAMES AS COULD WITH ANY DEGREE OF PRECISION BE ASCERTAINED.

BY THE LATE PRESIDENT.

'ACA'SABALLI', *Cassyta.*
Achyuta, *Morinda.*
'Acránti, *Solanum.*
Acsha.
Agastya, *Æschynomene.*
Agnis'ic'há.
Aguru, *Cordia.*
Alábu, *Cucurbita.*
Alamvusha, *Bryonia.*
Alarca, *Asclepias.*
Alpamárisha.
Amalá.
'Amalacì, *Phyllanthus.*
Ambasht'ha.
Amlána, *Gomphrena.*
Amlalónica, *Oxalis.*
Amlavétasa, *Hypericum.*
Amlicá, *Tamarindus.*
Amra, *Mangifera.*
Amrátaca, *Spondias.*
Ancót'a.
Ans'umátì.
An'u, *Oryza.*
Apámarga.
Aparájitá, *Clitoria.*
Arca, *Asclepias.*
'Ardraca, *Amomum.*
Ariméda.
Arishtâ, *Xanthium.*
Arjaca, *Ocymum.*
Arjuna, *Lagerstroemia?*
Arushcara, *Semecarpus.*
As'mantaca.
As'óca, a new genus.
'Asp'hóta, *Nyctanthes.*
'Aus'vríhi, *Oryza.*
Atavishá.
Aticharâ.
Atimucta, *Banisteria.*
'Avigna, *Carissa?*
Bacula, *Mimusops.*
Badarì, *Rhamus.*
Bahuvára.
Bahvanga, a new genus.
Bálá.
Bála.
Bandhúca, *Ixora.*
Banga, *Cannabis.*

Báta, *Ficus.*
Bhadramustaca, *Cyperus.*
Bhanga, *Gossypium.*
Bhanti, *Clerodendrum.*
Bhavya, *Dillenia.*
Bharadwájì.
Bhúchampaca, *Kœmpferia.*
Bhújambúca.
Bhúlavanga, *Jussiena.*
Bhurandí, *Ipomœa?*
Bhúrja.
Bhústrina, *Andropogan?*
Bhútavésì, *Nyctanthes.*
Berberá.
Bimba, *Bryonia?*
Bimbicá, the same?
Bráhmani, *Ovieda.*
Brahmasuverchalá.
Bráhmì, *Ruta.*
Bilva, *Cratœva.*
Biranga.
Cácamáchi.
Cácángì, *Aponogeton?*
Cachu, *Arum.*
Cadalì, *Musa.*
Cadamba, *Nauclea.*
Cahlára, *Nymphœa.*
Cálá.
Cálá.
Calambí.
Calami.
Caláya Cálinga, *Cucurbita.*
Calpaca.
Cámalatá, *Ipomœa.*
Cámpilla, a new genus.
Canchanára, *Bauhinia.*
Canda, *Dracontium.*
Candárála.
Candúra, *Dolichos.*
Candúru, *Scilla?*
Cangu.
Cantála, *Agave?*
Capilá.
Capitt'ha, *Limonia.*
Caranjáca, a new genus.
Caravélla, *Cleome?*
Cáravì, *Laurus.*
Caravíra, *Nerium.*
Carmaranga, *Averrhoa.*
Carnicára, *Pavetta.*
Carparála, *Aloë?*
Carpásì, *Gossypium.*
Carpúra, *Laurus.*
Caruna, *Citrus.*
Cása, Saccharum.
Cáshmìrá.
C'atáca, *Strychnos.*
Cátp'hala, *Tabernœmontana.*
Catu.
Cémuca.
Césara, *Crocus.*
Cétaca, *Pandamus.*
Chacralá.
C'hadira, *Mimosa.*
Ch'hatráca, *Agaricus.*
Campaca, *Michelia.*
Chanaca.
Chandà.
Chandana, *Santalum.*
Chandricá.
C'harjúra, *Phœnix.*
Carmacashá.
Chavaca.
Chitra.
Chitraca, *Plumbago.*
Chórapushpì, *Scirpus.*
Ciráta.
Códrava.
Córangi.
Cóvidára, *Bauhinia.*
Clítaca.
Cramuca.
Crishná.
Crìshnachúrá, *Poineiana.*
Cshíraví, *Asclepias?*
Cshumá, *Linum.*
Culaca, *Strychnos.*
Culmásha,
Cumbha.
Cumbhicá, *Pistia.*
Cumuda, *Menianthes.*
Cuncuma, *Crocus?*
Cunda, *Jasminum.*
Carubaca, *Barleria.*
Curuntaca.
Curuvaca.
Cus'a, *Poa.*
Cushmánda, *Cucumis?*

Cusumbha, *Carthamus.*
Cutaja, *Jasminum.*
Cuvalaya.
Cuveraca, *Swietenia.*
Dámápana.
Danticá.
Dhanyáca.
Dárima, *Punica.*
Dási.
Dévadaru, *Unona.*
Dhátaci.
Dhustúra, *Datura.*
Dónd, *Artemisia.*
Drácshá, *Vitis.*
Durgájátá, *Ophioglossum.*
Dúrvá, *Agrostis.*
Dwipatri, *Impatiens.*
Ela, *Amomum.*
Elabálucá.
Eranda, *Ricinus.*
Gajapippali, a new genus.
Gambhárí.
Gandálí.
Gandharája, *Gardenia.*
Gandíra, *Solanum?*
Gaurichandra, *Hedysarum.*
Ghantapátah.
Ghónta, *Rhamnus.*
Ghóshacá.
Grán'hila.
Grínjana, *Daucus.*
Gócantaca, *Barleria.*
Gódhápad'i.
Gódhúma, *Triticum.*
Gojihvá, *Elephantopus.*
Gólómí, *Agrostis?*
Gónardi, *Cyperus?*
Góraeshá.
Gowíeshí.
Góvará, *Eranthemum.*
Guggulu.
Gyha.
Gunjá, *Abrus.*
Guváca, *Areca.*
Haimavatí.
Halaca, *Nymphæa.*
Hanu.
Haricus'a, *Acanthus.*
Hardrái, *Curcuma.*
Harédrú.
Haritáci, *Terminchia.*
Haritála.
Haryanga, *Cissus.*
Hémapushpicá, *Jasminum.*
Hémaságara, *Cotyledon.*
Hilamochicá.
Himávat'í.
Hingu, *Terebinthus.*
Hingul'i, *Solanum.*
Hintala, *Elate.*
Holicá.
Jambíra, *Citrus.*
Jambu, *Eugenia.*
Jatamánsi, *Valeriana.*
Javá, *Terminalia?*
Jayap'hala, *Myristica.*
Jayant'i, *Oeschynomene.*
Icshu, *Saccharum.*
Icshura.
Icshwácu.
Jimúta.
Indívara, *Tradescantia?*
Jíraca.
Jívantí.
Indravárun'i.
Ingudí.
Irbáru.
Is'waramúla, *Aristolochia.*
Lácucha, *Astrocarpus.*
Langal'i, *Nama?*
Latárca, *Allium.*
Lasuna, *Allium.*
Laval'i, *Averrhoa.*
Lavanga, *Caryophyllus.*
Lodhra.
Madana, *Pisonia.*
Madhúca, *Bassia.*
Madhúlaca.
Madhúraca.
Madhusigru, *Guilandina.*
Mahájálí.
Mahásweta.
Malapu.
Málatí, *Jasminum.*
Mallicá, *Nyctanthes.*
Mánaca, *Arum.*
Mandára, *Erythrina.*
Márcara.

Marcati.
Maricha. *Capsicum.*
Marunmálá.
Másaparni.
Màsha, *Phaseolus.*
Máshaudari, *Calliearpa.*
Masúra.
Mátulanga, *Citrus.*
Mauri.
Mayúra.
Muchucunda, *Pentapetes.*
Mudga.
Mudgaparni.
Múlaca, *Raphanus.*
Mundaballi, *Ipomœa.*
Murá.
Murvá, *Aletris.*
Mustaca, *Schœmus.*
Nàgabalá, *Sida.*
Nágaballi, *Bauhinia.*
Nàgacésara, *Mesua.*
Nàgadána, *Artemisia.*
Nagaranga, *Citrus.*
Nala, *Aristida?*
Nali.
Náranga.
Naricéla, *Cocos.*
Nichula, a new genus.
Nili, *Indigofera.*
Nilótpala, *Pontederia.*
Nimba, *Melia.*
Nivàra, *Oryza.*
Pàcala.
Padma, *Nyphœa.*
Palándu, *Allium.*
Palása, *Butea.*
Panasa, *Artocarpus.*
Parnása, *Ocymum.*
Pátali, *Bignonia.*
Pátola, *Solanum.*
Paurá.
Pichula, *Tamarix.*
Pilu, *Aloë.*
Pinyá.
Pippala, *Ficus.*
Pippali, *Piper.*
Piyála.
Pi'tasála.
Placsha, *Ficus.*
Prí'sniparní.
Priyangu.
Pótica, *Physalis.*
Punarnavà, *Boerhaavia.*
Pundarica.
Pundra.
Pûticaraja, *Guilandina.*
Ractamúla, *Oldenlandia.*
Rájádana.
Rajaní.
Rájica.
Rásh'tricá.
Rasná, *Ophioxylum.*
Rénuca.
Riddhi.
Rishabha.
Róchaná.
Róhita, *Punica.*
Sácótaca, *Trophis.*
Sahacára, *Magnifera.*
Sahachari.
Sailéya, *Muscus.*
Sairlyaca, *Banleria.*
Saivala.
'Sala.
'Salanchí.
'Sálmali, *Bombax.*
Samangá, 2?
'Sami, *Mimosa.*
Samíra, *Mimosa.*
Samudraca, *Aquilicia.*
Saná, *Crotalaria.*
Sanacrajatá, *Hedysarum.*
'Sanc'hapushpa, *Coix.*
'Sara.
Sarala.
Saraná.
'Satamulí.
Satapushpa.
Sáthi.
Sep'hálicá, *Nyctanthes.*
Septalá, *Nyctanthes.*
Septaparna, *Echites.*
Sershapa, *Synapis.*
'Simbi, *Dolichos.*
Sindhúca, *Vitex.*
Sirísha, *Mimosa.*
Sisu, *Croton?*
Sivá.

Śóbhánjana, *Guilandina.*
Sómalatá, *Ruta?*
Sômaraj'i, *Pœderia.*
Sólp'ha.
Śónaca, *Bignonia.*
Sringátaca, *Trapa.*
Sripatna.
St'halapadma, *Hibiscus.*
Suca.
Sucri.
Sunishnnaca, *Marsilea.*
Surabhi.
Súryamani, *Hibiscus.*
Suvernaca, *Cassia.*
Syáma, a new genus.
Syámáca.
Tála, *Borassus.*
Tálamùlaca, *Cochlearia?*
Tálí, *Corypha.*
Tamálá, *Laurus?*
Támbúlis, *Piper.*
Támraçúta, *Nicotiana.*
Táraca, *Amomum?*
Taruni, *Aloe.*
Tatpatri, *Laurus.*
Tila, *Sésanum.*
Tilaca.
Tindúca, *Diospyros.*
Tinsa, *Ebenus.*
Trupusha, *Cucumus.*
Trayamána.
Trivritá.
Tubaricá.
Túla, *Morus.*
Tunga.
Udumbara, *Ficus.*
Ulapa, *Aristida.*
Upódica.
Úrana, *Cassia.*
Utpala?
Vajradru, *Euphorbia.*
Valvaja, *Andropogon.*
Vanácéli, *Canna.*
Vanamudga.
Vanárdraca, *Costus.*
Vandá, *Epidendrum.*
Vandá, *Loranthus.*
Vandá, *Viscum.*
Vanaca, *Quercus.*
Vans'a, *Bambos.*
Várábi.
Varàngace, *Laurus.*
Váruna.
Vásaca, *Dyanthera.*
Vásalyà.
Vástuca, *Amaranthus.*
Vasu.
Vátaca.
Vatsádaní, *Menispermum.*
Váyasóli.
Vétasa, *Barleria.*
Vétra, *Calamus.*
Vichitrá, *Tragia.*
Vidári.
Vidula.
Vírana, *Andropogon.*
Vishání.
Vistáraca, *Convolvulus.*
Vrsthí, *Oryza.*
Vyághranac'ha.
Vyághrapáda.
Yása.
Yava, *Hordeum,*
Yavasa, *Poa?*
Yuctárasá.
Yút'hicá, *Jasminum.*

BOTANICAL OBSERVATIONS

ON

SELECT INDIAN PLANTS.

BY THE LATE PRESIDENT.

'IF my names of plants displease you,' says the great *Swedish* botanist, 'choose others more 'agreeable to your taste;' and, by this candour, he has disarmed all the criticism, to which, as it must be allowed, even the critical parts of his admirable works lie continually open. I avail myself of his indulgence, and am very solicitous to give *Indian* plants their true *Indian* appellations; because I am fully persuaded that *Linnæus* himself would have adopted them, had he known the learned and ancient language of this country; as he, like all other men, would have retained the native names of *Asiatic* regions and cities, rivers and mountains; leaving friends, or persons of eminence, to preserve their own names by their own merit, and inventing new ones, from distinguishing marks and properties for such objects only as, being recently discovered, could have had no previous denomination. Far am I from doubting the great importance of perfect *botanical descriptions;* for languages expire as nations decay, and the true sense of many appellatives, in every dead language, must be lost in a course of ages; but, as long as those ap-

pellatives remain understood, a travelling physician, who should wish to procure an *Arabian* or *Indian* plant, and, without asking for it by its learned or vulgar name, should hunt for it in the woods by its *botanical character*, would resemble a geographer, who, desiring to find his way in a foreign city or province, should never inquire, by name, for a street or a town, but wait with his tables and instruments, for a proper occasion to determine its longitude and latitude.

The plants described in the following paper by their classical appellations, with their synonyma, or epithets, and their names in the vulgar dialects, have been selected for their novelty, beauty, poetical fame, reputed use in medicine, or supposed holiness; and frequent allusions to them all will be found, if the *Sanscrit* language should ever be generally studied, in the popular and sacred poems of the ancient *Hindus*, in their medical books and law-tracts, and even in the *Védas* themselves. Though, unhappily I cannot profess, with the fortunate *Swede* to have seen without glasses all the parts of the flowers which I have described, yet you may be assured that I have mentioned no part of them which I have not again and again examined with my own eyes: and though the weakness of my sight will for ever prevent my becoming a botanist, yet I have in some little degree atoned for that fatal defect by extreme attention, and by an ardent zeal for the most lovely and fascinating branch of natural knowledge.

Before I was acquainted with the method pursued by *Van Rheede*, necessity had obliged me to follow a similar plan on a smaller scale; and, as his mode of studying botany, in a country and climate by no means favourable to botanical excursions, may be adopted more successfully by those who have more leisure than

I shall ever enjoy, I present you with an interesting passage from one of his prefaces, to which I should barely have referred you, if his great work were not unfortunately confined, from its rarity, to very few hands. He informs us, in an introduction to his third volume, "that several *Indian* physicians and *Bráhmins* had "composed, by his order, a catalogue of the most "celebrated plants, which they distributed according "to their times of blossoming and seeding, to the "configuration of their leaves, and to the forms of "their flowers and fruit; that, at the proper seasons, "he gave copies of the list to several intelligent "men, of whom he sent parties into different forests, "with instructions to bring him, from all quarters, such "plants as they saw named, with their fruit, flowers, "and leaves, even though they should be obliged to "climb the most lofty trees for them; that three or "four painters, who lived in his family, constantly "and accurately delineated the fresh plants, of which, "in his presence, a full description was added; that, "in the mean while, he had earnestly requested all "the princes and chiefs on the *Malabar* coast to send "him such vegetables as were most distinguished for "use or for elegance; and that not one of them "failed to supply his garden with flowers, which "he sometimes received from the distance of fifty or "sixty leagues; that when his herbalists had collected "a sufficient number of plants, when his draughtsmen "had sketched their figures, and his native botanists had subjoined their description, he submitted "the drawings to a little academy of *Pandits*, whom "he used to convene for that purpose from different "parts of the country; that his assembly often consisted of fifteen or sixteen learned natives, who vied "with each other in giving correct answers to all his "questions concerning the names and virtues of the "principal vegetables; and that he wrote all their answers in his note-book; that he was infinitely de-

" lighted with the candid, modest, amicable, and re-
" spectful debates of those pagan philosophers, each
" of whom adduced passages from ancient books in
" support of his own opinion, but without any bitter-
" ness of contest or the least perturbation of mind;
" that the texts which they cited, were in verse, and
" taken from books, as they positively asserted, more
" than four thousand years old: that the first couplet
" of each section in those books comprised the synony-
" mous terms for the plant, which was the subject
" of it; and that, in the subsequent verses, there
" was an ample account of its kind or species, its
" properties, accidents, qualities, figure, parts,
" place of growth, time of flowering and bearing
" fruit, medical virtues, and more general uses;
" that they quoted those texts by memory, having
" gotten them by heart in their earliest youth, rather
" as a play than a study, according to the immemorial
" usage of such *Indian* tribes as are destined by law
" to the learned professions; and on that singular
" law of tribes, peculiar to the old *Egyptians* and *In-*
" *dians*, he adds many solid and pertinent remarks."
Now when we complain, and myself as much as any, that we have no leisure in *India* for literary and philosophical pursuits, we should consider that *Van Rheede* was a nobleman, at the head of an *Indian* government, in his time very considerable, and that he fully discharged all the duties of his important station, while he found leisure to compile, in the manner just described, those twelve large volumes which *Linnæus* himself pronounces *accurate*.

1. *Táraca:*
Vulg. Thrac.
Linn. Amomum.
Cal. Perianth spathe-like, but sitting on the germ; tubular, one-leaved, broken at the mouth into a few

irregular sharp toothlets; downy, striated; in part coloured, in part semi-pellucid.

Cor. One-petaled, villous. *Tube* short, funnel-form. *Border* double. *Exterior* three parted; coloured like the calyx; *divisions* oblong, striated, internally concave, rounded into slipper-like bags; the two *lower* divisions equal, rather deflected; the higher somewhat longer, opposite, bent in a contrary direction, terminated with a long point. *Interior*, two-lipped (unless the *upper* lip be called the filament); *under* lip revolute, with a tooth on each side near the base; two parted from the middle; *divisions* axe-form, irregularly end-nicked. *Nectaries*, two or three honey-bearing, light brown, glossy bodies at the base of the *under* lip, just below the teeth; erect, awled, converging into a small cone.

Stam. Filament (unless it be called the *upper* lip, of the *interior border*) channelled within, sheathing the style; dilated above into the large fleshy *anther*, if it can justly be so named. *Anther* oblong, externally convex and entire, internally flat, divided by a deep furrow; each *division* marked with a perpendicular pollen-bearing line, and ending in a membraneous point.

Pist. Germ beneath, protuberant, roundish, obscurely three-sided, externally soft with down. *Style*, thread-form, long as the *filament*, the top of which nearly closes round it. *Stigma* headed, perforated.

Per. Capsule (or *Capsular berry*, not bursting in a determinate mode) oblong-roundish, three-striped, smooth, crowned with permanent calyx and corol; with a brittle coat, almost black without, pearly within.

Seeds lopped, with three or four angles, very smooth, inclosed within three oblong, rounded, soft, membraneous integuments, conjoined by a branchy receptacle; in each parcel, four or five.

Interior border of the corol, pink and white; *under* lip internally milk-white, with a rich carmine-stripe in each of its divisions. *Seeds* aromatic, hotter than *Cardamoms*. *Leaves* alternate, sheathing, oblong, pointed, keeled, most entire, margined, bright grass-green above, very smooth; pale sea-green below. *Stem* compressed, three or four feet long, bright pink near its base, erect, ending in a beautiful panicle. *Peduncles* many-flowered; *bracts* few, lance-linear, very long, withering. *Root* fibrous, with two or three bulbous knobs, light brown and spungy within, faintly aromatic.

Although the *Taraca* has properties of an *Amomum*, and appears to be one of those plants which *Rumphius* names *Globba*, yet it has the air of a *Languas*, the *fruit*, I believe, of a *Renealmia*, and no exact correspondence with any of the genera so elaborately described by *Koenig*: its *essential character*, according to *Retz*, would consist in its *two-parted interior border*, its *channelled filament*, and its *two-cleft anther* with *pointed divisions*.

2. *Bhúchampaca*:
Vulg. *Búchampac.*
Linn. Round-rooted *Kæmpferia.*
Cal. Common *Spathe* imbricated, many-flowered; partial: *Perianth* one-leaved, small, thin, obscure.
Cor. One petaled. *Tube* very long, slender, subcylindric below, funnel-form above, somewhat incurved. *Border* double, each three-parted; *exterior* divisions lanced, acute, dropping; *interior*, two *higher* divisions erect, lapping over, oblong, pointed, supporting the back of the anther; *lower* division expanding, deflected, two-cleft; *subdivisions* broad, axe-form, irregularly notched, end-nicked, with a point.

Stam. Filament adhering to the throat of the *corol*, oblong below, enlarged, and two-lobed above, coloured. *Anther* double, linear, higher than the mouth of the tube, fixed on the lower part of the filament, conjoined round the pistil, fronting the two-cleft division of the border.

Pist. Germ very low near the root, attended with a *nectareous* gland. *Style* capillary, very long. *Stigma* funnel-form below, compressed above; fan-shaped, two-lipped, downy, emerging a little from the conjoined *anther*.

Per. and *Seeds* not yet seen.

Scape thickish, very short. *Corol* richly fragrant; *tube* and *exterior border* milk-white, divisions dropping, as if sensitive, on the slightest touch, and soon yielding to the pressure of the air; *interior border* purple, the higher divisions diluted, the lower deeply coloured within, variegated near the base. One or two flowers blow every morning in *April* or *May*, wither entirely before sun-set; after the *spike* is exhausted, rise the large *leaves* keeled, broad-lanced, membraneous nerved. *Root* with many roundish, or rather spindle-shaped *bulbs*.

This plant is clearly the *Benchâpo* of *Rheede*, whose native assistant had written *Bhu* on the drawing, and intended to follow it with *Champá:* the spicy odour and elegance of the flowers, induced me to place this *Kæmpferia* (though generally known) in a series of select *Indian* plants; but the name *Ground Champac* is very improper, since the true *Champaca* belongs to a different order and class; nor is there any resemblance between the two flowers, except that both have a rich aromatic scent.

Among all the *natural orders*, there is none in which the genera seems less precisely ascertained by clear *essential characters*, than in that which (for want of a bet-

ter denomination) has been called *scitamineous*; and the judicious *Retz*, after confessing himself rather dissatisfied with his own generic arrangement, which he takes from the *border* of the corol, from the *stamen*, and principally from the *anther*, declares his fixed opinion, that *the genera in this order will never be determined with absolute certainty until all the scitamineous plants of* India *shall be perfectly described.*

3 *Sép'halicá:*
Syn. Suvahá, Nirgudí, Nílicá, Nivácicá.
Vulg. Singaha, Nibári.
Linn. Sorrowful *Nyctanthes.*

In all the plants of this species examined by me, the *calyx* was villous; the *border* of the corol white, five-parted, each division unequally subdivided; and the *tube* of a dark orange-colour; the *stamens* and *pistil* entirely within the *tube:* the *berries* twin, compressed, capsular, two-celled, margined, inverse-hearted, with a point. This *gay* tree (for nothing *sorrowful* appears in its nature) spreads its rich odour to a considerable distance every evening; but at sunrise it sheds most of its *night-flowers*, which are collected with care for the use of perfumers and dyers. My *Pandits* unanimously assure me, that the plant before us is their *Sép'hálicá*, thus named because *bees* are supposed to *sleep* on its blossoms; but *Nílica* must imply a blue colour; and our travellers insist that the *Indians* give the names of *Párijáticá*, or *Párijáta* to this useful species of *Nyctanthes.* On the other hand, I know that *Párijáta* is a name given to flowers of a genus totally different; and there may be a variety of this with *bluish* corols; for it is expressly declared in the *Amarcósh*, that, "when the *Sép'há-*" *licá* has *white* flowers, it is named *Swétasurasá*, and "*Bhútavési.*"

4. α. *Maghya.*
Syn. Cunda.

Linn. Nyctanthes Sambac.
See *Rheede:* 6 H. M. tab. 54.
Flowers exquisitely white, but with little or no fragrance; *stem, petioles,* and *calx* very downy; *leaves* egged, acute; below rather hearted.
β *Septala.*
Syn. Navamallicá, Navamálicá.
Vulg. Béla, Muta-béla.
Burm. Many-flowered Nyctanthes.
See 5 *Rumph.* tab. 30. 6 H. M. *tab.* 50.

The blossoms of this variety are extremely fragrant. *Zambak* (so the word should be written) is a flower to which *Persian* and *Arabian* poets frequently allude.

5. *Mallica.*
Syn. Trinasúlya, Malli, Bhúpadí, Satabhira.
Vulg. Dési-béla.
Linn. Wavy-leaved *Nyctanthes.*
Berry globular, simple, one-celled. *Seed* large, single, globular.

According to *Rheede,* the *Bráhmins* in the west of *India* distinguish this flower by the word *Castúri,* or *musk,* on account of its very rich odour.

6. *' Asp'hotá:*
Syn. Vanamallì.
Vulg. Banmallica.
Linn. Narrow-leaved *Nyctanthes.*

The *Indians* consider this as a variety of the former species; and the flowers are nearly alike. *Obtuse-leaved* would have been a better specific name: the *petals,* indeed, are comparatively *narrow,* but not the leaves. This charming flower grows wild in the forests, whence it was called *Vanajáti* by the *Bráhmins,*

who assisted *Rheede;* but the *Játi*, or *Maláta*, belongs, I believe, to the next genus.

7. *Málatí:*
Syn. Sumaná, Játi.
Vulg. Máltì, Játi, Chambélì.
Linn. Great flowered *Jasmin.*
Buds blushing; *corol,* mostly with purplish edges. *Leaves* feathered with an odd one, two or three of the terminal *leaflets* generally confluent.

Though *Málati* and *Játi* be synonymous, yet some of the native gardeners distinguish them; and it is the *Játi* only that I have examined. *Commeline* had been informed that the *Javans* give the name of *Malati* to the *Zambak*, which in *Sanscrit* is called *Navamallicá*, and which, according to *Rheede*, is used by the *Hindus* in their sacrifices; but they make offerings of most odoriferous flowers, and particularly of the various *Jasmins* and *Zambaks.*

8. *Yut'hicá.*
Syn. Mágadhí, Ganicá, Ambasht'há, Yút'hì.
Vulg. Jút'hi, Júi.
Linn. Azorick Jasmin.
Leaves opposite, three'd. *Branchlets* cross-armed. *Umbels* three-flowered. *Corols* white, very fragrant. The yellow *Yút'hìcà*, say the *Hindus*, is called *Hémapushpicà*, or *golden-flowered;* but I have never seen it; and it may be of a different species.

9. *Amlicá:*
Syn. Tintidí, Chinchá.
Vulg. Tintirí; Tamrú'hindí, or *Indian* Date.
Linn. Tamarindus.

The flowers of the *Tamarind* are so exquisitely beautiful, the fruit so salubrious when an acid sher-

bet is required, the leaves so elegantly formed and arranged, and the whole tree so magnificient, that I could not refrain from giving a place in this series to a plant already well known. In all the flowers, however, that I have examined, the coalition of the stamens appeared so invariably, that the *Tamarind* should be removed, I think, to the *sixteenth* class; and it were to be wished that so barbarous a word as *Tamarindus*, corrupted from an *Arabic* phrase absurd in itself, since the plant has no sort of resemblance to a date-tree, could, without inconvenience, be rejected, and its *Indian* appellation admitted in its room.

10. *Sara*; or *Arrow-cane.*
Syn. Gundra, or playful; *Téjanaca*, or Acute.
Vulg. Ser, *Serheri.*
Linn. Spontaneous Saccharum.
Cal. *Glume* two-valved; *valves* oblong-lanced, pointed, sub-equal, girt with silky diverging hairs, exquisitely soft and delicate, more than twice as long as the flower.
Cor. One-valved, acute, fringed.
Stam. *Filaments* three, capillary; *Anthers* oblong, incumbent.
Pist. *Gems* very minute; *styles* two, thread-form. *Stigmas* feathery.

Flowers on a very large terminal *panicle*, more than two feet long, in the plant before me, and one foot across in the broadest part; consisting of numerous compound *spikes*, divided into *spikelets*, each on a capillary jointed rachis, at the joints of which are the flowers alternately sessile and pedicelled. *Common peduncle* many-furrowed, with reddish joints. *Valvelet* of the corol purple, or light red; stamens and pistils ruddy; *stigmas* purple; pedicels of a reddish tint, finely contrasted with the long silvery beard of the calyx. *Leaves* very long, striated, minutely sawed;

teeth upwards; keel smooth, white within, sheathing the culm; the mouth of the sheaths thick, set with white hairs. *Culm* above twenty feet high; very smooth, round, and light; more closely jointed and woody near the root, which is thick and fibrous: it grows in large clumps, like the *Venu*. This beautiful and superb grass is highly celebrated in the *Puránas*, the *Indian* God of War having been born in a grove of it, which burst into a flame; and the gods gave notice of his birth to the nymph of the *Pleiads*, who descended and suckled the child, thence named *Cárticéya*. The *Cúsá*, vulgarly *Casia*, has a shorter culm, leaves much narrower, longer, and thicker hairs, but a smaller panicle, less compounded, without the purplish tints of the *Sara*. It is often described, with praise, by the *Hindu* poets for the whiteness of its blossoms, which gave a large plain, at some distance, the appearance of a broad river. Both plants are extremely useful to the *Indians*, who harden the internodal parts of the culms, and cut them into implements for writing on their polished paper. From the *munja*, or culm, of the *Sara* was made the *maunji*, or holy thread, ordained by *Menu* to form the sacerdotal girdle, in preference even to the *cusa*-grass.

11. *Dúrvá:*
Syn. *'Sataparvicá, Sahasravìryá, Bhárgavi, Rudri, Anantá.*
Vulg. *Dúb.*
Koen. *Agrostis Linearis.*

Nothing essential can be added to the mere botanical description of this most beautiful grass, which *Van Rheede* has exhibited in a coarse delineation of its leaves only, under the barbarous appellation of *Beli-caraga*. Its flowers, in their perfect state, are among the loveliest objects in the vegetable world, and appear, through a lens, like minute rubies and

Durra
Agrostis linearis of D. Koenig
E
F
A
B
C
D
G
a
Lonicera page 252.

emeralds in constant motion, from the least breath of air. It is the sweetest and most nutritious pasture for cattle; and its usefulness, added to its beauty, induced the *Hindus*, in their earliest ages, to believe that it was the mansion of a benevolent nymph. Even the *Véda* celebrates it; as in the following text of the *Á'tharvana:* "May *Dúrvá*, which rose from the water of "life, which has a hundred roots and a hundred "stems, efface a hundred of my sins, and prolong "my existence on earth for a hundred years!" The plate was engraved from a drawing in Dr. *Roxburgh's* valuable collection of *Indian* grasses.

12. *Cusa*, or *Cusha*.
Syn. Cut'ha, Darbha, Pavitra.
Vulg. Cusha.
Koen. Poa Cynosuroides.

Having never seen this most celebrated grass in a state of perfect inflorescence, I class it according to the information which Dr. *Roxburgh* has been so kind as to send me. The *leaves* are very long, with margins acutely sawed downwards, but smooth on other parts, even on the keels, and with long points, of which the extreme acuteness was proverbial among the old *Hindus*. Every law-book, and almost every poem in *Sanscrit*, contains frequent allusions to the holiness of this plant; and, in the fourth *Véda* we have the following address to it at the close of a terrible incantation: "Thee, O *Darbha*, the learned proclaim "a divinity not subject to age or death; thee they "call the armour of *Indra*, the preserver of regions, "the destroyer of enemies; a gem that gives increase "to the field. At the time when the ocean resounded, when the clouds murmured, and lightnings "flashed, then was *Darbha* produced, pure as a drop "of fine gold." Some of the *leaves* taper to a most acute, evanescent point; whence the *Pandits* often

say of a very sharp-minded man, that his intellects are *acute as the point of* a *Cusa*-leaf.

13. *Bandhúca:*
Syn. Ractaca, Bandhujívaca.
Vulg. Bándhútì, Ronjan.
Linn. Scarlet *Ixora.*
Cal. Perianth four-parted, permanent; *divisions* coloured, erect, acute.
Cor. One-petaled, funnel-form. *Tube* cylindric, very long, slender, somewhat curved. Border four-parted; *divisions* egged, acute, deflected.
Stam. Filaments four, above the throat very short, incurved. *Anthers* oblong, depressed.
Pist. Germ roundish, oblate beneath. *Style* thread-form, long as the tube. *Stigma* two-cleft, just above the throat; *divisions* externally curved.
Per.
Seeds.
Flowers bright crimson-scarlet, umbel-fascicled. *Leaves* oval, cross-paired, half-stem-clasping; pointed, pale below, dark green above, leathery, clothing the whole plant. *Stipules* between the opposite leaves erect, linear. *Stem* russet, channelled.

The *Bandhúca* flower is often mentioned by the best *Indian* poets; but the *Pandits* are strangely divided in opinion concerning the plant which the ancients knew by that name. *Rádhácánt* brought me, as the famed *Bandhúca*, some flowers of the *Doubtful Papaver*; and his younger brother *Ramacánt* produced on the following day the *Scarlet Ixora*, with a beautiful couplet, in which it is named *Bandhúca*: Soon after, *Servóru*, showed me a book in which it is said to have the vulgar name *Dóp'hariya*, or *Meridian*; but by that *Hindostánì* name the *Mussulmans* in some districts mean the *Scarlet Pentapetes*; and in others,

the *Scarlet Hibiscus*, which the *Hindus* call *Súryamani*, or *Gem of the Sun*. The last mentioned plant is the *Siasmin* of *Rheede*, which *Linnæus*, through mere inadvertence, has confounded, with the *Scarlet Pentapetes*, described in the *fifty-sixth* plate of the same volume. I cannot refrain from adding, that no *Indian* god was ever named *Ixora*; and that *Is'wara*, which is indeed a title of *Siva*, would be a very improper appellation of a plant which has already a classical name.

14. *Carnicára:*
Syn. Drumótpala, Pericyá'dha.
Vulg. Cá'ncrá; Cat'hachampá.
Linn. Indian Pavetta.

It is wonderful that the *Pandits* of this province, both priests and physicians, are unable to bring me the flower which *Cálidása* mentions by the name of *Carnicátra*, and celebrates *as a flame of the woods*. The lovely *Pavetta*, which botanists have sufficiently described, is called by the *Bengal* peasants *Cá'ncrá*, which I should conclude to be a corruption of the *Sanscrit* word, if a comment on the *Amarácósh* had not exhibited the vulgar name *Cat'ha-champá*; which raises a doubt, and almost inclines me to believe that the *carnicára* is one of the many flowers which the natives of this country improperly called wild *Champacs*.

15. *Má'shamárí;*
Vulg. Masandarí in *Bengal*, and *Bastra* in *Hindostán*.
Linn. American Callicarpus; yet a native of *Java?*
Cal. *Perianth* one-leaved, four-parted; *Divisions* pointed, erect.
Cor. One-petaled, funnel-form; *border* four-cleft.
Stam. *Filaments* four, thread-form, coloured, longer than the corol. *Anthers* roundish, incumbent.

Pist. Germ above, egged. *Style* thread-form, coloured, longer than the stamens. *Stigma* thickish, gaping.
Per.
Seeds.

Flowers minute, bright lilac, or light purple, extremely beautiful. *Panicles* axillary, one to each leaf, two-forked, very short in comparison of the leaves, downy. *Bracts* awled, opposite, placed at each fork of the panicle. *Leaves* opposite, petioled, very long, egged, veined, pointed, *obtusely notched*, bright green and soft above, pale and downy beneath. *Branches* and *petiols* hoary with down. *Shrub*, with flexible branches; growing wild near *Calcutta;* its *root* has medicinal virtues, and *cures*, they say, a cutaneous disorder called *Másha*, whence the plant has its name. Though the leaves be not sawed, yet I dare not pronounce the *species* to be new. See a note on the *Hoary Callicarpus*, 5 *Retz. Facic.* p. 1. *n.* 19.

16. *Sringáata.*
Syn. Sringátaca.
Vulg. Singhára.
Linn. Floating *Trapa.*

I can add nothing to what has been written on this remarkable water-plant; but as the ancient *Hindus* were so fond of its *nut* (from the *horns* of which they gave a name to the plant itself) that they placed it among their lunar constellations, it may certainly claim a place in a series of *Indian* vegetables.

17. *Chandana.*
Syn. Gandhasára, Malayaja, Bhadrasrí.
Vulg. Chandan, Sandal, Sanders.
Linn. True *Santalum;* more properly *Sandalum.*
Seed large, globular, smooth.

Having received from Colonel *Fullarton* many seeds of this exquisite plant, which he had found in the thickets of *Midnapúr*, I had a sanguine hope of being able to describe its flowers, of which *Rumphius* could procure no account, and concerning which there is a singular difference between *Linnæus* and *Burman* the younger, though they both cite the same authors, and each refers to the works of the other; but the seeds have never germinated in my garden, and the *Chandan* only claims a place in the present series, from the deserved celebrity of its fragrant wood, and the perpetual mention of it in the most ancient books of the *Hindus*, who constantly describe the best sort of it as flourishing on the mountains of *Malaya*. An elegant *Sanscrit* stanza, of which the following *Version* is literally exact, alludes to the popular belief, that the *Vénus*, or *Bambus*, as they are vulgarly called, often take fire by the violence of their collision; and is addressed, under the allegory of a sandal-tree, to a virtuous man dwelling in a town inhabited by contending factions: "Delight of the world, beloved *Chandana*, stay no longer "in this forest, which is overspread with rigid pernicious *Vansas*, whose hearts are unsound; and "who, being themselves confounded in the scorching stream of flames kindled by their mutual attrition, will consume not their own families merely, "but this whole wood." The original word *Durvansa* has a double sense, meaning both a dangerous *bambu*, and a man with a mischievous *offspring*. Three other species, or varieties of *Chandan*, are mentioned in the *Amaracósha*, by the names *Tailaparnica*, *Gósírsha*, and *Herichandana:* the red sandal (of which I can give no description) is named *Cuchandana* from its inferior quality, *Ranjana* and *Racta* from its colour, and *Tilaparni* or *Patranga*, from the form of its leaves.

18. *Cumuda:*
Syn. Cairava.
Vulg. Ghain-chú.
Rheede: Tsjeroca Cit Ambel. 11 H. M. t. 29.
Linn. Menianthes?
Cal. Five-parted, longer than the tube of the corol, expanding, permanent; *divisions* awled.
Cor. One-petaled. *Tube,* rather belled; *border* five-parted; *divisions* oblong, wavy on the margin: a longitudinal wing or foldlet in the middle of each. The mouth and whole interior part of the corol shaggy.
Stam. Filaments five, awled, erect; *Anthers* twin, converging; five, alternate, shorter, steril.
Pist. Germ egged, very large in proportion; gift at its base with five roundish glands. *Style* very short, if any. *Stigma* headed.
Per. Capsule four-celled, many-seeded.
Seeds round, compressed, minute, appearing rough, with small dots or points.
Leaves hearted, subtargeted, bright green on one side, dark russet on the other. *Flowers* umbel fascicled, placed on the stem, just below the leaf; *Glands* and *Tube* of the corol yellow; *border* white; both of the most exquisite texture: *Cumuda,* or Delight of the Water, seems a general name for beautiful aquatic flowers; and among them, according to *Van Rheede,* for the *Indian Menianthes,* which this in part resembles. The *divisions* of the corol may be called *three-winged:* they look as if covered with silver frost.

19. *Chitraca.*
Syn. Páth'in Vahni, and all other names of *Fire.*
Vulg. Chita, Chitá, Chitrá.
Linn. Plumbago of *Silán.*
Cal. Perianth one-leaved, egg-oblong, tubular, five-sided; rugged, interspersed with minute pedicelled

glands, exuding transparent glutinous droplets; erect, closely embracing the tube of the corol; *mouth* five-toothed; *base* protuberant with the valves of the nectary.

Cor. One-petaled, funnel-form. *Tube* five-angled, rather incurved, *longer* than the calyx. *Border* five-parted, expanding. *Divisions* inverse, egg-oblong, pointed, somewhat keeled.

Nectary five-valved, pointed, minute, including the germ.

Stam. Filaments five, thread-form, inserted on the valvelets of the nectary as long as the tube of the corol. *Anthers* oblong, oblique.

Pist. Germ egged, very small: at first, when cleared of the nectary, smooth; but assuming as it swells, five-angles. *Style* columnar, as long as the stamens. *Stigma* five-parted, slender.

Per. None, unless we give that name to the five-angled coat of the seed.

Seed one, oblong, obscurely five-sided, inclosed in a coat.

Racemas viscid, leafy. *Calyx* light green. *Corol* milk-white. *Anthers* purple, seen through the pellucid tube. *Leaves* alternate, egged, smooth, pointed, half sheathing, partly waved, partly entire; *floral-leaves* similar, minute. *Stem* flexible (climbing) many-angled, jointed at the rise of the leaves. *Root* caustic; whence the name *Vahni*, and the like. *Chitraca* means *attracting the mind;* and any of the *Indian* names would be preferable to *Plumbago, or Leadwort.* The species here described, seems most to resemble that of *Ceilan;* the *rosy Plumbago* is less common here: the joints of its stems are red; the *bracts* three'd, egged, equally pointed, coloured.

20. *Cámalatá:*
Syn. Súryá-cánti or *Sunshine*, 11 H. M. *t.* 60.
Vulg. Cám-latá, Ishk-píchah.
Linn. Ipomœa Quamoclit.

The plant before us is the most beautiful of its order, both in the colour and form of its leaves and flowers; its elegant blossoms are *celestial rosy red, love's proper hue*, and have justly procured it the name of *Cámalatá*, or *Love's Creeper*; from which I should have thought *Quamoclit* a corruption, if there were not some reason to suppose it an *American* word. *Cámalatá* may also mean a mythological plant, by which all *desires* are granted to such as inhabit the heaven of *Indra*; and if ever flower was *worthy* of *paradise*, it is our charming *Ipomœa*. Many species of this genus, and of its near ally the *Convolvulus*, grow wild in our *Indian* provinces; some spreading a purple light over the hedges, some snow-white with a delicate fragrance; and one breathing, after sunset, the odour of cloves; but the two genera are so blended by playful nature, that very frequently they are undistinguishable by the *corols* and *stigmas*: for instance, the *Mundavalli*, or *Beautiful Climber*, of *Rheede* (of which I have often watched the large spiral-buds, and seen them burst into full bloom) is called *Ipomœa* by *Linnæus*, and *Convolvulus* (according to the Supplement) by *Kœnig*; and it seems a shade between both. The divisions of the *perianth* are egg-oblong, pointed; free above, intricated below; its *corol* and *tube*, those of an *Ipomœa*; its *filaments* of different lengths, with *anthers* arrowed, jointed above the barbs, furrowed half-incumbent; the *stigmas*, two globular heads, each globe an aggregate of minute roundish tubercles; the *stem* not quite smooth, but here and there bearing a few small prickles; the very large *corol* exquisitely white, with greenish ribs, that seem to act as muscles in expanding the contorted bud; its *odour* in the evening very agreeable; less strong than the primrose, and less faint than the lily. The clove-scented creeper, which blows in my garden at a season and hour when I cannot examine it accurately, seems of the same genus, if not of the same species, with the *Mundavalli*.

21. *Cadamba:*
Syn. *Nipa, Priyaca, Halyprya.*
Vulg. *Cadamb, Cadam.*
Linn. Oriental *Nauclea.*

To the botanical description of this plant I can add nothing, except that I always observed a minute five-parted *calyx* to each floret, and that the *leaves* are oblong, acute, opposite, and transversely nerved. It is one of the most elegant among *Indian* trees, in the opinion of all who have seen it, and one of the holiest, among them, in the opinion of the *Hindus*. The poet *Cálidás* alludes to it by the name of *Nipa;* and it may justly be celebrated among the beauties of summer, when the multitude of aggregate flowers, each consisting of a *common receptacle*, perfectly globular, and covered uniformly with gold-coloured florets, from which the white thread-form *styles* conspicuously emerge, exhibits a rich and singular appearance on the branchy trees decked with foliage charmingly verdant. The flowers have an odour, very agreeable in the open air, which the ancient *Indians* compared to the scent of new *wine;* and hence they call the plant *Halyprya*, or *beloved by Halin*, that is, by the third *Ráma*, who was evidently the *Bacchus* of *India*.

22. *Gandíra:*
Syn. *Samasht'hilà, Lavana-bhanta'ca.*
Vulg. *Lona-bhant; Ins; Salatiyà.*
Linn. *Solanum.* Is it the *Verbascum*-leaved?
Cal. *Perianth* one-leaved, cup-form, or belled, obscurely five-cleft, downy, pale, frosted, permanent. *Divisions* egged, erect, pointed, very villous.
Cor. One-petaled. *Tube* very short. *Border* five-parted. *Divisions* oblong, pointed, expanding, villous.
Stam. *Filaments* five, most short in the mouth of

the tube. *Anthers* oblong, furrowed, converging, nearly coalescent, with two large pores gaping above.

Pist. Germ roundish, villous. *Style* thread-form, much longer than the stamens. *Stigma* obtuse-headed.

Per. Berry roundish, dotted above, hoary, divided into cells by a fleshy *receptacle*, with two or three wings.

Seeds very many, roundish, compressed, nestling.

Leaves alternate, egg-oblong, pointed, rather wavy on the margin, delicately fringed with down; darker and very soft above, paler below, with protuberant veins, downy on both sides, mostly decurrent on the long hoary petiols.

Stem shrubby, scabrous with tubercles, unarmed. *Flowers* umbel-fascicled. *Corols* white. *Anthers* yellow. *Peduncles* and *pedicles* hoary with deciduous frost.

This plant is believed to contain a quantity of *lavana*, or *salt*, which makes it useful as a manure; but the single word *Bhantáca*, vulgarly *Bhant*, means the *Clerodendrum*, which (without being unfortunate) beautifies our *Indian* fields and hedges with its very black *berry* in the centre of a bright red expanding permanent calyx. The charming little bird *Chatráca*, commonly called *Chattárya*, or *Tuntuni*, forms its wonderful nest with a leaf of this downy *Solanum*, which it sews with the silk-cotton of the *Seven-leaved Bombax*, by the help of its delicate but sharp bill: that lovely bird is well known by the *Linnæan* appellation of *Motacilla Sartoria*, properly *Sartrix*; but the figures of it that have been published, give no idea of its engaging and exquisite beauty.

23. *Samudraca:*
Syn. Dhóla-samudra.

Vulg. Dhól-samudr.

Linn. Aquilicia; but a new species.

Cal. Perianth one-leaved, funnel-shaped, five-toothed, short, the *teeth* closely pressing the corol; permanent.

Cor. Petals five, egg-oblong, sessible, greenish; acute, curved inwards, with a small angled concave appendage. *Nectary* tubular, fleshy, five-parted, yellowish; *divisions*, egg-oblong, doubled, compressed like minute bags with inverted mouths; inclosing the germ.

Stam. Filaments five, smooth and convex externally, bent into the top of the *nectary*, between the divisions or scales, and compressing it into a globular figure. *Anthers* arrowed; the points hidden within the nectary, surrounding the *stigma;* the barbs without, in the form of a star.

Pist. Germ roundish. *Style* cylindric. *Stigma* obtuse.

Per. Berry roundish, flattened, naved, longitudinally furrowed, mostly five-celled.

Seeds solitary, three-sided, externally convex. *Cymes* mostly three-parted. *Stem* deeply channelled, jointed, two-forked. *Peduncles* also jointed and channelled. *Fructification* bursting laterally, where the stem sends forth a petiol. *Berries* black, watery. *Leaves* alternate, except one terminal pair; hearted, pointed, toothed; twelve or fourteen of the teeth shooting into lobes; above, dark green; below, pale, ribbed with processes from the petiol, and reticulated with protuberant veins; the full-grown leaves above two feet long from the apex, and nearly as broad toward the base; many of them rather targetted. This new species may be called *large-leaved*, or *Aquilicia Samudraca*. The species described by the younger *Burman*, under the name of the *Indian Staphylea*, is not uncommon at *Crishna-nagar;* where the peasants call it *Cáca-jangha*, or *Crow's foot:* if they are correct, we have

erroneously supposed the *Coing* of the modern *Bengalese* to be the *Ca'cángi* of the ancient *Hindus*. It must not be omitted, that the stem of the *Aquilicia Sambucina* is also channelled, but its *fructification* differs in many respects from the descriptions of *Burman* and *Linnæus*; though there can be no doubt as to the identity of the genus.

24. *Sómaráji:*
Syn. Avalguja, Suballi, Sómballicá, Ca'lameshi, Crishnáphalá Va'cuchì, Váguji, Pú'tip'hallì.
Vulg. Sómráj, Bacuchi.
Linn. Fetid Pæderia.
The characters as in *Linnæus*, with a few variations. *Calyx* incurved. *Corol* very shaggy within. *Style* two-cleft, pubescent; *divisions* contorted. *Stem* climbing, smooth. *Leaves* opposite, long-petioled; the lower ones oblong, hearted; the higher, egg-oblong, veined, with a wavy margin. *Panicles* axillary (except the highest) cross-armed. *Flowers* beautiful to the sight, crimson, with milk-white edges, resembling the *Dianthus*, vulgarly called *Sweet William*, but resembling it only in form and colours; almost scentless to those who are very near it, but diffusing to a distance a rank odour of carrion. All the peasants at *Crishna-nagar* called this plant *Samráj*; but my own servants, and a family of *Bráhmins* from *Tribéni*, gave that name to a very different plant of the *nineteenth* class, which I took, on a cursory inspection, for a *Prenanthes*.

25. *Syámá:*
Syn. Gopí, Sárivá, Ananta, Utpalasáriva, Gópí, Gopálica, Gópavallì.
Vulg. Syámá-latá.
Rheede; in *Malabar* letters, *Puppá'l-vallì.*

Cal. Perianth one-leaved, five-toothed, erect, minute, permanent.

Cor. One-petaled, salver-form. *Tube* itself cylindric, but protuberant in the middle with the germ and anthers; *throat* very villous. *Border* five-parted; *divisions* very long, lance-linear, spirally contorted, fringed, closed, concealing the fructification.

Stam. Filaments, if any, very short. *Anthers*, five, awled, erect, converging at the top.

Pist. Germ above, pedicelled, spheroidal, girt with a *nectareous* ring. *Style* thread-form, rather awled. *Stigma* simple.

Per. Capsule one-celled; one seeded, roundish, hispid.

Seed oval, very minute, glossy.

Flowers raceme-panicled, greenish-white, very small, scented like those of the hawthorn, but far sweeter; and thence the *Portuguese* called them *honey-flowers.*

Peduncles axillary, russet; *pedicles* many-flowered. *Branchlets* milky. *Leaves* opposite, lance-oval, pointed at both ends, most entire veined; above, dark green; below, pale. *Stipules* linear, axillary, adhering. *Stem* climbing, round, of a russet hue, rimmed at the insertion of the short *petiols.*

The ripe fruit of this elegant climber, which *Cálidás* mentions in his poem of the *Seasons*, has been seen by me only in a very dry state; but it seemed that the hispid appearance of the *capsules*, or *berries*, which in a microscope looked exactly like the burs in *Van Rheede*'s engraving, was caused by the hardened calyxes and fringe of the permanent corols; the *seeds* in each bur were numerous, and like black-shining sand, for no single pericarp could be disengaged from it; and it is described as *one-seeded*, merely from an inspection of the dissected

germ. Before I had seen the *fruit*, I thought the *Syáma* very nearly connected with the *Shrubby Apocynum*, which it resembles in the *leaves*, and in parts of the *corol*.

Five of the *Sanscrit* names are strung together, by the author of the *Amaracósh*, in the following verse:

Goópi śyámá śárivá syádanatótpalá sarivá:

and his commentator observes, that the last name was given to the *Sárivá* from the resemblance of its flowers to those of the *Utpala*, which I thence conclude to be a *Menianthes*, especially as it is always described among the *Indian* water-plants. The other synonymous words are taken from *Váchaspati*.

26. *Avigna*, or *Avinga*:
Syn. Crishnapácap'hala, Sushénas, Caramardaca.
Vulg. Caróndà, or *Caraundà* in two dictionaries; in one, *Pániamalá.*
Linn. Carissa Carandas.
Cal. Perianth five-cleft, acute, very small, coloured, persistent.
Cor. One-petaled, funnel-form. *Tube* longish; *throat* swoln by the inclosed anthers. *Border* five-parted; *divisions* oblong; one side of each embracing the next.
Stam. Filaments five, extremely short. *Anthers* oblong, erect.
Pist. Germ above, roundish. *Style* thread-form, short, clubbed. *Stigma* narrower, pubescent.
Per. Berry elliptoïdal, two-celled.
Seeds, at least seven, oval, compressed, margined. *Flowers* milk-white, jasmin-like. *Fruit* beautiful in form and colour, finely shaded with carmine and white; agreeably acid. *Branches* two-forked.

Leaves opposite, short petioled, elliptic, obtuse, most entire, smooth; some *small leaves* roundish inverse-hearted. *Thorns* axillary, opposite, expanding; *points* bright red. *Peduncles* twin, subterminal, three-flowered; *pedicels* equal. The whole plant, even the fruit, milky. We have both species of *Carissa* in this province; but they melt, scarce distinguishably, into each other.

The *Pandits* have always brought me this elegant plant as the *Carcandu*, mentioned by *Jayadéva*; but, judging only by the shape and taste of the fruit, they seem to confound it with the *Rhamnus Jujuba*; and the confusion is increased by the obscurity of the following passage in their best vocabulary:

Carcandhú, vadarí, cóli; cólam, cuvala ph'eníle,
Sauviram, vadaram, ghónta--------

All agree that the *neuter* words mean *fruits* only; but some insist, that the *Ghóntá* is a distinct plant, thus described in an ancient verse: 'The *ghónta*, 'called also *gópaphónta*, is a tree shaped like the 'Vadarí, with a very small fruit, growing only in 'forests.' For the *ghónta*, here known by the name of *Séha'cul*, my servants brought me *Rhamnus* with *leaves* alternate egg-oblong, three-nerved, obscurely sawed, paler beneath, and most beautifully veined; *floral young leaves* crowded, very long, linear; *prickles* crowded, very long, linear; *prickles* often solitary, sometimes paired, one straight, one curved; a small globular *drupe*, quite black, with a one-celled *nut*: the flowers I never saw perfect; but it seems the *nineteenth* species of *Linnæus*. We have many species of *Rhamnus* in our woods and hedges; some like the *Alaternus*, polygamous by male and hermaphrodite flowers; others, distinguished by various forms and positions of the *prickles* and *leaves*; but the common

Badarì or *Baiar*, is the *Jujuba-tree*, described by *Rheede;* and by *Rumphius* called *Indian* Apple-tree. Its *Persian* name is *Conár;* by which it is mentioned in the letters of *Pietro della Valle*, who takes notice of the *soapy froth* procured from its leaves; whence it has in *Sanscrit* the epithet *p'hénila*, or *frothy*. To the plant the *Arabs* give the name of *Sidr*, and to its fruit that of *Nabik;* from which perhaps, *Napeca* has been corrupted.

27. *Caravíra:*
Syn. Pratihása, Satapra'sa, Chan'da'ta, Hayama'raca.
Linn. Nerium Oleander. and other species.
Vulg. Canér, Carbír.

A plant so well known would not have been inserted in this place, if it had not been thought proper to take notice of the remarkable epithet *hayama'raca*, or *horse-killer;* which rose from an opinion still preserved among the *Hindus*, that a horse, unwarily eating the leaves of the *Nerium*, can hardly escape death: most of the species, especially their roots, have strong medicinal, but probably narcotic powers. The *blue-dying Nerium* grows in woods at a little distance from my garden; and the *Hindu* peasants, who brought it me, called it *Nil*, or *blue:* a proof that its quality was known to them, as it probably was to their ancestors, from time immemorial.

28. *Septaparna*, or *seven leaved:*
Syn. Visála-tvach, Sáradi, Vishama-ch'hada.
Vulg. Ch'hitavan, Ch'hátiyán, Ch'háton.
Linn. School Echites.
Cal. Perianth five-parted, sub-acute, small, villous, permanent; closing round the germ immediately on the removal of the tube.
Cor. One-petaled, funnel-form. *Tube* cylindric below, prominent above, with inclosed anthers, very

villous in the throat. *Border* five-parted, shorter than the tube: *divisions* inverse-egged, obtuse, oblique, reflected, waved on the margin.

Nectary, a circular undivided coronet, or rim, terminating the tube, with a short erect villous edge.

Stam. Filaments five, cylindric, very short in the throat of the tube. *Anthers* heart-harrowed, cleft, pointed, forming a star, visible through the mouth of the tube, with points diverging.

Pist. Germ above roundish-egged, very villous, scarce extricable, from the calyx enclosing and grasping it. *Style* cylindric, as long as the tube. *Stigma* two-parted, with parts diverging, placed on an irregular orblet.

Per. Follicles two, linear, very long, one-valved.

Seeds numerous, oblong, compressed with silky pappus, pencilled at both ends.

NOTE.

The whole of the plant milky. *Stém* dotted with minute whitish tubercles. *Leaves* mostly sevened in verticils at short distances, very soft, oblong inverse-egged, some pointed, some obtuse, some end-nicked; some entire, some rather scallopped; with many transverse parallel veins on each side of the axis; rich dark green above, diluted below. *Petiols* furrowed above, smooth and convex beneath, elongated into a strong protuberant nerve continually diminishing and evanescent at the apex. *Stipules* above erect, acute, set in a coronet round the stem; the verticils of the leaves answering to the definition of fronds. *Flowers* rather small, greenish white, with a very particular odour, less pleasant than that of elder-flowers. *Peduncles* terminal, with two verticils pedicelled umbel-wise, but horizontal. *Pedicel*, six-headed, many-flowered; highest verticils similar to those heads, more crowded. *Tree* very large when full grown; light and elegant when young. This plant so greatly resembles the *Pala* of *Van Rheede* (which has more of the *Nerium* than of the *Tabernæmontana*) that I suspect the genus and the species to be the same, with some variety. That author says, that the *Bramins* call it *Santenú*, but his *Nagari* letters make it *Savánu;* and neither of the words is to be found in *Sanscrit*. With all due respect for *Plumier* and *Burman*, I should call this plant *Nerium Septaparna:* it is the *Pule* of *Rumphius*, who enumerates its various *uses* at great length and with great confidence.

29. *Arca*:
Syn. Vasuca, Asp'hóta, Gonárúpa, Vicirana, Mandára, Arcaperna; and any name of the *Sun.*
Vulg. Acand, Anc.
Linn. Gigantic Asclepias.
Nectaries with two glanded compressed folds, instead of *awled hornlets* at the summit; spirally eared at the base. *Filaments* twisted in the folds of the nectaries. *Anthers* flat, smooth, rather wedge-form. *Styles* near half an inch long, subcylindric. *Stigmas* expanded. *Flowers* terminal and axillary umbel-fascicled; amethyst-coloured, with some darker shades of purple on the petals and nectaries; the starred corpuscle bright yellow. *Leaves* opposite, heart oblong, mostly inverse-egged, subtargeted, very rarely stem-clasping, pointed, villous on both sides, hoary beneath, with soft down; *petiols* very short, concave and bearded above, with a thickish conical *stipule.* The whole plant filled with caustic milk. A variety of this species has exquisitely delicate milk-white flowers; it is named *Alarca* or *Pratápsa*, and highly esteemed for its antispasmodic powers. The *Padmárca*, which I have not seen, is said to have small crimson corols. The individual plants, often examined by me, vary considerably in the forms of the leaves and the tops of the nectary.

30. *Pichula:*
Syn. J'hávaca.
Vulg. J'hau.
Koen. Indian Tamarix?
Flowers very small, whitish, with a light purple tinge, crowded on a number of spikes, which form all together a most elegant pannicle. *Stem* generally bent, often straight, and used anciently for arrows by the *Persians*, who call the plant *Gaz.* The celebrated shaft of *Isfendiyár* was formed of it, as I learned from *Bahmen*, who first showed it to me

on a bank of the *Ganges*, but asserted that it was common in *Persia*. The *leaves* are extremely minute, sessile, mostly imbricated. *Calyx* and *corol* as described by *Linnæus*; five filaments considerably longer than the petal; *anthers* lobed, furrowed; *germ* very small; *style* scarce any; *stigmas* three, revolute, but, to my eyes, hardly feathered.

Nothing can be more beautiful than the appearance of this plant in flower during the rains, on the banks of the rivers, where it is commonly interwoven with a lovely twining *Asclepias*; of which the following description is, I hope, very exact:

31. *Dugdhicá*, or *Milk-plant*.
Syn. Cshírávi Dugdhicá.
Vulg. Kyirui, Dúdhi, Dúdh-latá.
Linn. Esculent Periploca.
Cal. One-leaved, five-parted; *divisions* awled, acute, coloured, expanding.
Cor. One-petaled, salver-form, star-like, *divisions* five, egged, pointed, fringed.
Nectary double, on a five-cleft base, gibbous between the clefts, protuded, and pointed above, surrounded with a bright green villous rim: *exterior* five-parted; *divisions* egged, converging, attenuated into daggers; each concave externally, gibbous below the cavity, which is two-parted and wrinkled within. *Interior* a five-parted corpuscle, lopped above, five-angled, surrounding the fructification.
Stam. Filaments scarce any. *Anthers* five, roundish, very minute, set round the summit of the lopped corpuscle.
Pist. Germs two, egged, pointed, erect, internally flat. *Styles* none, unless you so call the *points* of the germs. *Stigma*, none but the *interior nectary*, unless you consider that as a common *stigma*.

Per. Follicles two, oblong; in some, pointed; in others, obtuse; inflated, one-valved; each containing a one-winged *receptacle.*

Seeds numerous, roundish, compressed, crowned with pappus.

To each pair of leaves, a peduncle mostly two-flowered, often with three, sometimes with five, flowers. *Calyx* reddish. *Corol* white, elegantly marked with purple veins; *fringe,* white, thick; *anthers* black. *Leaves,* linear-awled, pointed, opposite, petioled, with one strong nerve; *stipules* very soft, minute. *Stem* smooth, round, twining; the whole plant abounding with *milk.*

32. *Langali:*

Syn. Saradì, To'yapippalì, Saculádanì,

Vulg. Cánchrà, Isholangolyá.

Rheede. Chéru-vallél?

Linn. Nama of *Sila'n.*

Cal. Perianth one-leaved, five-parted, villous; *divisions* lanced, pointed, long, permanent.

Cor. One-petaled, nearly wheeled. *Tube* very short, *Border* five-parted. *Divisions* egged.

Stam. Filaments five, awled, expanding; from the mouth of the tube, adhering to the divisions of the border by rhomboidal concave bases convergent above. *Anthers* large, arrowed.

Pist. Germ above, egg-oblong, two-cleft. *Styles* two, azure, funnel-form, diverging almost horizontally. *Stigmas* lopped, open.

Per. Capsule many-seeded.

Seeds very minute.

Stem herbaceous, branchy, smooth, pale, creeping. *Leaves* alternate, short-petioled, most entire, lance-oblong, smooth, acutish. *Peduncles* mostly axillary, sometimes terminal, villous, often many-flowered, subumbelled, three-rayed, with *involucres*

general and partial. *Corols* bright blue, or violet. *Stamens* white. The plant is aquatic, and by no means peculiar to *Silàn:* I have great reason, however, to doubt whether it be the *Làngali* of the *Amaracósh*, which is certainly the *Canchrà* of *Bengal;* for though it was first brought to me by that name, yet my gardener insists that *Canchrà* is a very different plant, which, on examination, appears to be the *Ascending Jussieua* of *Linnæus*, with *leaves inverse-egged, smooth*, and *peduncles shorter:* its fibrous, creeping *roots* are purplish, *buoys* white, pointed, solitary; and at the top of the *germ* sits a *nectary* composed of five shaggy bodies, arched like horse-shoes, with external honey-bearing cavities.

33. *Umá:*
Syn. Atasí, Cshuma'.
Vulg. Tisì, Masana'.
Linn. Most common Linum.
Cal. Perianth five-leaved; leaflets oblong, acute, imbricated, keeled, fringed minutely, having somewhat reflected at the points.
Cor. Small, blue: petals notched, striated, wavy, reflex, imbricated.
Stam. Anthers light blue, converging, no rudiments of filaments.
Pist. Germ large. *Style* pale blue. *Stigma* simple.
Per. Capsule pointed; furrowed.
Root simple.
Stem Herbaceous, low, erect, furrowed, *knotty?* naked at the base.
Leaves linear, three-nerved, alternate crosswise, sessile, smooth, obtuse, reflected, stipuled, *glanded?*
Stipules linear. Q. a minute *gland* at the base.

34. *Múrvá:*

Syn. Dévì, Madhurasá, Móratá, Téjanì, Survá, Madhusrénì, Gòcarnì, Píluparnì.

Vulg. Muraga, Murahará, Murgábi.

Linn. Hyacinthoïd, Aletris.

Cal. None.

Cor. One-petaled, funnel-form, six angled. *Tube* short, bellied with the germ. *Border* six-parted. *Divisions* lanced; three quite reflected in a circle; three alternate, deflected, pointed.

Stam. Filaments six, awled, as long as the corol, diverging, inserted in the base of the divisions. *Anthers* oblong, incumbent.

Pist. Germ inverse-egged, obscurely three-sided, with two or three *honey-bearing* pores on the flattish top. *Style* awled, one-furrowed, as long as the stamens. *Stigma* clubbed.

Pericarp and *Seeds* not yet inspected.

Root fibrous, tawny, obscurely jointed, stolon-bearing. *Scape* long, columnar, sheathed with leaves, imbricated from the root; a few sheaths above, straggling. *Leaves* fleshy, channelled, sword-form, keeled, terminated with awls, the interior ones longer, mostly arched, variegated with transverse undulating bands of a dark green hue, approaching to black.

Raceme erect, very long. *Flowers*, from three to seven in each fascicle, on very short petiols. *Bracts* linear, minute. *Corols* pale pea-green, with a delicate fragrance, resembling that of the *Peruvian Heliotrope;* some of the *Sanscrit* names allude to the *honey* of these delicious flowers; but the nectareous pores at the top of the germ are not very distinct: in one copy of the *Amaracósha* we read *Dhanuh srénì* among the synonyma; and if that word, which means *a series of bows*, be correct, it must allude either to the *arched leaves* or to the *reflected divisions* of the corol. This *Aletris*

appears to be a *night-flower:* the raceme being covered every evening with fresh blossoms, which fall before sun-rise.

From the leaves of this plant, the ancient *Hindus* extricated a very tough elastic thread, called *Maurvi,* of which they made bow-strings, and which, for that reason, was ordained by *Menu* to form the sacrificial zone of the *military* class.

35. *Taruni:*
Syn. Sahá, Cumarí.
Vulg. Ghrita-cumári.
Linn. Two-ranked Aloe, A Perfoliata, P?
Flowers racemed. pendulous, subcylindric, rather incurved. *Bracts,* one to each peduncle, awled, concave, deciduous, pale, with three dark stripes. *Corol* six-parted; three *external divisions,* orange-scarlet; *internal divisions,* orange-scarlet; *internal,* yellow, keeled, more fleshy, and more highly coloured in the middle. *Filaments* with a double curvature. *Germ* six-furrowed. *Stigma* simple. *Leaves* awled, two-ranked; the lowest expanding; sea-green, very fleshy; externally quite convex, edged with soft thorns; variegated on both sides with white spots. *Van Rheede* exhibits the *true Aloe* by the name of *Cumári;* but the specimen brought me by a native gardener, seemed a variety of the *two-ranked,* though melting into the species, which immediately precedes it in *Linnæus.*

36. *Bacula.*
Syn. Césára.
Vulg. Mulsarí, or *Múlasrí.*
Linn. Mimusops Elengi.
Cal. Perianth eight-leaved; *leaflets* egged, acute, permanent; four *interior,* simple; four *exterior,* leathery.

Cor. Petals sixteen, lanced, expanding; as long as the *calyx; Nectary* eight-leaved; *leaflets* lanced, converging round the stamen and pistil.

Stam. Filaments eight (or from seven to ten) awled, very short, hairy. *Anthers* oblong, erect.

Pist. Germ above, roundish, villous. *Style,* cylindric. *Stigma* obtuse.

Per. Drupe oval, pointed; bright orange-scarlet.

Nut oval, wrinkled, flattish, and smooth at one edge; broad and two-furrowed at the other.

Flowers agreeably fragrant in the open air, but with too strong a perfume to give pleasure in an apartment. Since it must require the imagination of a *Burman* to discover in them a resemblance to the face of a man, or of an ape, the genus, will, I hope, be called *Bacula*; by which name it is frequently celebrated in the *Purânas*, and even placed among the flowers of the *Hindu* paradise. *Leaves* alternate, petioled, egg-oblong pointed, smooth. The tree is very ornamental in parks and pleasure-grounds.

37. *Aśóca:*

Syn. Vanjula.

Cal. Perianth two-leaved, closely embracing the tube.

Cor. One-petaled. *Tube* long; cylindric, subincurved; *mouth* encircled with a nectareous rim. *Border* four-parted; *divisions,* roundish.

Stam. Filaments eight, long, coloured, inserted on the rim of the tube. *Anthers* kidney-shaped.

Pist. Germ above, oblong, flat. *Style* short, downy. *Stigma bent,* simple.

Per. Legume long, compressed at first, then protuberant with the swelling seeds; incurved, strongly veined and margined, sharp-pointed.

Seeds from two to eight, solid, large, many-shaped, some oblong-roundish, some rhomboidal, some rather kidney-shaped, mostly thick, some flat. *Leaves*

egg-oblong-lanced, opposite, mostly five-paired, nerved; long, from four or five to twelve or thirteen inches.

The *number* of stamens varies considerably in the same plant: they are from six or seven to eight or nine; but the regular number seems *eight*, one in the interstices of the corol, and one before the centre of each division. Most of the flowers, indeed, have one abortive stamen, and some only mark its place, but many are perfect; and *Van Rheede* speaks of *eight* as the constant number: in fact no part of the plant is constant. *Flowers* fascicled, fragrant just after sun-set, and before sun-rise, when they are fresh with the evening and morning dew; beautifully diversified with tints of orange-scarlet, of pale yellow, and of bright orange, which grows deeper every day, and forms a variety of shades according to the age of each blossom that opens in the fascicle. The vegetable world scarce exhibits a richer sight than an *Asóca*-tree in full bloom: it is about as high as an ordinary cherry-tree. A *Bráhmin* informs me, that one species of the *Asóca* is a creeper; and *Jayadéva* gives it the epithet *voluble*: the *Sanscrit* name will, I hope, be retained by botanists, as it perpetually occurs in the old *Indian* poems, and in treatises on religious rites.

38. *Saivála*:
Syn. *Janalìlì*. *Saivalì*.
Vulg. *Simár*, *Syálá*, *Pátasyálá*, *Séhálá*.
Linn. Vallisneria? R.
Cal. *Common Spathe* one-leaved, many-flowered, very long, furrowed, two-cleft at the top; each division end-nicked. *Proper Perianth* three-parted; *divisions* awled.
Cor. *Petals* three, linear, long, expanding, fleshy.

Stam. Filaments invariably nine, thread-form. *Anthers* erect, oblong, furrowed.

Pist. Germ egged, uneven. *Styles* always three, short, awled, expanding. *Stigmas* three, simple.

Per. Capsule very long, smooth, awled, one-celled, infolded in an angled *Spathe.*

Seeds very numerous, murexed, in a viscid mucus.

Flowerets, from six to fourteen, small. *Scape* compressed, very narrow, fleshy, furrowed in the middle.

Pedicel of the floweret thread-form, crimson above; proper *perianth*, russet; *petals* white; *anthers* deep yellow. *Leaves* sword-form, pointed, very narrow, smooth, and soft, about two feet long, crowded, white at the base. *Root* small, fibrous. It flourishes in the ponds at *Crishna-nagar.* The refiners of sugar use it in this province. If this plant be a *Vallisneria*, I have been so unfortunate as never to have seen a female plant, nor fewer than nine stamens in one blossom out of more than a hundred, which I carefully examined.

39. *Púticaraja:*
Syn. Pracírya, Pútica, Calimáraca.
Vulg. Nátácaranja.
Linn. Guilandina Bonduccella.

The species of this genus vary in a singular manner: on several plants, with the oblong leaflets and *double prickles* of the *Bonduccella*, I could see only *male* flowers as *Rheede* has described them; they were yellow, with an aromatic fragrance. Others, with similar *leaves* and *prickles*, were clearly *polygamous*, and the flowers had the following character.

MALE.

Cal. Perianth one-leaved, salver-form, downy; *Border* five-parted, with equal oblong *divisions.*

Cor. Petals five, wedge-form, obtusely notched at the top; four equal, erect, the fifth depressed.

Stam. Filaments ten, awled, inserted in the calyx, villous, very unequal in length. *Anthers* oblong, furrowed, incumbent.

HERMAPHRODITE.

Calyx, Corol, Stamens, as before.

Pist. Germ oblong, villous. *Style* cylindric, longer than the filaments. *Stigma* simple.

Per. and *Seeds* well described by *Linnæus*.

Flowers yellow; the depressed petal variegated with red specks. *Bracts* three-fold, roundish, pointed. *Spikes* set with floral leaflets lanced, four-fold, reflected.

40. *Sobhánjana:*

Syn. Sigru, Ticshna, Gandhaca, A'cshíva, Móchaca.

Vulg. Sajjana, Moranga.

Linn. Guilandina Moringa.

Cal. Perianth one-leaved. *Tube* short, unequal, gibbous. *Border* five-parted. *Divisions* oblong-lanced, subequal; first deflected, then revolute; coloured below, white above.

Cor. Petals five, inserted into the calyx, resembling a boat-form flower. *Wing*-like, *two*, inverse-egged, clawed, expanding.

Awning-like, two, inverse-egged, erect; *claws* shorter.

Keel-like, one, oblong, concave; enclosing the fructification; beyond it, spatuled; longer than the *wing*-petals.

Stam. Filaments five, fertile; three bent over the pistil: two shorter, inserted into the claws of the middle petals. *Anthers* twin, rather mooned, obtuse, incumbent. *Five* steril (often *four* only) alternate with the fertile, shorter; their bases villous.

Pist. Germ oblong, coloured, villous; below it a nectar-bearing gland. *Style* shorter than the stamen, rather downy, curved, thicker above. *Stigma* simple.

Per. Legume very long, slender, wreathed, pointed, three-sided, channelled, prominent with seeds, one-celled.

Seeds many, winged, three-sided.

Tree very high; *branches* in an extreme degree light and beautiful, rich with clustering flowers. *Stem exuding* a red gum. *Leaves* mostly thrice-feathered with an odd one; *leaflets* some inverse-egged, some egged, some oval, minutely end-nicked. *Raceme-panicles* mostly axillary. In perfect flowers the whole calyx is quite deflected, counterfeiting five petals; whence *Van Rheede* made it a part of the corol. *Corols* delicately odorous; milk-white, but the two central erect petals beautifully tinged with pink. The *root* answers all the purposes of our horse-radish, both for the table and for medicine; the fruit and blossoms are dressed in *caris*. In hundreds of its flowers, examined by me with attention, five stamens and a pistil were invariably perfect; indeed, it is possible that they may be only the female hermaphrodites, and that the males have ten perfect stamens with pistils abortive; but no such flowers have been discovered by me after a most diligent search.

There is another species or variety, called *Menhu Sigru*, that is Honey-*Sigru:* a word intended to be expressed on *Van Rheede's* plate in *Nagari* letters; its vulgar name is *Muna*, or *Racta sajjana*, because its flowers or wood are of a *redder* hue.

Linnæus refers to Mrs. *Blackwell*, who represents this plant by the name of *Balanus Myrepsica*, as the

celebrated *Ben*, properly *Ba'n*, of the *Arabian* physicians and poets.

41. *Cóvidá'ra:*
Syn. Cá'nchaná'ra, Chamarica, Cuddala, Yugapatra.
Vulg. Cachnár, Racta cá'nchan.
Linn. Variegated Bauhinia.
Cal. Perianth one-leaved, obscurely five-cleft, deciduous.
Cor. Petals five, egged, clawed, expanded, wavy; one more distant, more beautiful, striated.
Stam. Filaments ten, unequally connected at the base; five shorter. *Anthers* double, incumbent.
Pist. Germ above, oblong. *Style* incurved. *Stigma* simple, ascending.
Per. Legume flattish, long, pointed, mostly five-celled.
Seeds mostly five; compressed, wrinkled, roundish.
Leaves rather hearted, two-lobed; some with rounded, some with pointed, lobes. *Flowers* chiefly purplish and rose-coloured, fragrant; the sweet and beautiful buds are eaten by the natives in their savoury messes. We have seen many species and varieties of this charming plant: one had racemed flowers, with petals equal, expanding, lanced, exquisitely white, with a rose-coloured stripe from the base of each to its centre; *anthers* four only, fertile; six much shorter, steril; a second had three fertile, and seven very short, barren; another had light purple corols, with no more than five filaments, three longer, coloured, curved in a line of beauty. A noble *Climbing Bauhinia* was lately sent from *Nípál*; with flowers racemed, cream-coloured; *style* pink; *germ* villous: *stamens* three filaments, with rudiments of two more; *stem* downy, four-furrowed, often spirally. *Tendrils* opposite, below the leaves. *Leaves* two-lobed, extremely large: it is a stout climber up

the highest *Arundo Vénu.* The *Sanscrit* name *Mandára* is erroneously applied to this plant in the first volume of *Van Rheede.*

42. *Capitt'ha:*

Syn. Gráhin. Dadhitt'ha, Manmat'ha; Dadhip'hala, Pushpap'hala, Dantas'at'ha.

Vulg. Cal'h-bél.

Koen. Crateva, Valanga.

Cal. Perianth five-parted, minute, deciduous; *divisions* expanded, acute.

Cor. Petals five, equal, oblong, reflected.

Stam. Filaments ten, very short, with a small *gland* between each pair, awled, furrowed, *Anthers* thick, five times as long as the filaments; furrowed, coloured, erect, expanding.

Pist. Germ roundish, girt with a downy coronet. *Style* cylindric, short. *Stigma* simple.

Per. Berry large spheroidal, rugged, often warted externally, netted within; many-seeded.

Seeds oblong-roundish, flat, woolly, nestling in five parcels, affixed by long threads to the branchy receptacles.

Flowers axillary, mostly toward the unarmed extremity of the branch. *Divisions* of the *Perianth* with pink tips; *petals* pale; *anthers* crimson, or covered with bright yellow pollen. *Fruit* extremely acid before its maturity; when ripe, filled with dark brown pulp, agreeably subacid. *Leaves* jointedly feathered with an odd one; *leaflets* five, seven, or nine; small, glossy, very dark on one side, inverse-hearted, obtusely-notched, dotted round the margin with pellucid specks, very strongly flavoured and scented like anise. *Thorns* long, sharp, solitary, ascending, nearly cross-armed, axillary, three or four petiols to one thorn. *Kleinhoff* limits the height of the tree to *thirty* feet, but we have young trees forty or fifty feet high; and at *Bandell*

there is a full-grown *Capitt'ha*, equal in size to the true *Bilva*; from its fancied resemblance to which the vulgar name has been taken. When the trees flourish, the air around them breathes the odour of anise, both from the leaves and the blossoms: and I cannot help mentioning a singular fact which may indeed have been purely accidental: not a single flower, out of hundreds examined by me, had both *perfect germs* and anthers *visibly fertile*, while others, on the same tree and at the same time, had their anthers profusely covered with *pollen*, but scarce any *styles*: and *germs* to all appearance *abortive*.

43. *Cuvéraca:*

Syn. Tunna, Tuni, Cach'ha, Cantalaca, Cuni, Nandivricsha:

Vulg. Túni, Tún; absurdly *Vilâyatì Nim.*

Linn. Between *Cedrela* and *Swietenia.*

Cal. Perianth one-leaved, five-cleft, minute, deciduous: *divisions* roundish, concave, villous, expanding.

Cor. Rather belled. *Petals* five, inverse-egged, obtuse, concave, erect, white with a greenish tint, *three* exterior lapping over the *two* others. *Nectary* short, five-parted: *divisions* roundish, orange-scarlet, bright and concave at the insertion of the stamens; rather downy.

Stam. Filaments five; inserted on the *divisions* of the nectary, awled, somewhat converging, nearly as long as the style. *Anthers* doubled, some three-parted, curved, incumbent.

Pist. Germ egged, obscurely five-cleft. *Style* awled, erect, rather longer than the corol. *Stigma* broad-headed, flat, bright green, circular, starred.

Per. Capsule egged, five-celled, woody, gaping at the base. *Receptacle* five-angled.

Seeds imbricated, winged.

Leaves feathered, scarce ever with an odd one; *pairs* from six to twelve; *petioles* gibbous at their insertion, channelled on one side, convex and smooth on the other. *Stipules* thick, short, rourdish; *leaflets* oblong-*lanced*, pointed, waved, veined; nerve on one side. *Panicles* large, diffuse, consisting of compound racemes. *Nectaries* yielding a fine yellow dye. *Wood* light, in colour like *Mahagoni*.

44. *Nichula:*
Syn. Ambuja, Ijjala.
Vulg. Hijala, Badia, Jyúli.
Cal. Perianth one-leaved, belled, fleshy, downy-coloured, permanent, five-parted; *divisions* erect, pointed.
Cor. Five-petaled: *petals* egged, short pointed, revolute, downy within and without.
Stam. Filaments ten, five mostly shorter; inserted in the bell of the calyx; awled, villous. *Anthers* erect, oblong, furrowed.
Pist. Germ egg-oblong, very villous. *Style* thread-form, curved. *Stigma* headed, with five obtuse corners.
Per. Drupe sub-globular.
Nut scabrous, convex on one side, angled on the other.
Leaves feathered; *pairs*, from five to nine; *leaflets* oblong, daggered, notched. *Calyx* pale pink. *Corol* darker pink without, bright yellow within. *Cyme* terminal, spreading.

45. *Atimucta:*
Syn. Pundraca, Vásanti, Mádhavílata.
Vulg. Mádhavílata.
Linn. Bengal Banisteria.
Rheed.: Dexenda, 6 H. M. tab. 59.
Cal. Perianth one-leaved, five-parted, permanent;

divisions coloured, oblong-oval, obtuse; between two of them a rigid glossy honey-bearing *tubercle*, hearted, acute.

Cor. Five-petaled, imitating a boat-form corol. *Wings*, two petals, conjoined back to back, involving the *nectary*, and retaining the honey.

Awning, large concave, more beautifully coloured. *Keel*, two petals, less than the wings, but similar. All five roundish, elegantly fringed, with reflected margins, and short oblong claws.

Stam. Filaments ten; one longer. *Anthers* oblong, thickish, furrowed.

Pist. Germs two, or three, coalesced. *Style* one, thread-form, incurved, shorter than the longest filament. *Stigma* simple.

Per. Capsules two or three, mostly two, coalesced back to back; each keeled, and extended into three oblong membraneous *wings*, the lateral shorter than the central.

Seeds roundish, solitary.

Racemes axillary. *Flowers* delicately fragrant; white, with a shade of pink; the large petal supported by the nectareous tubercle, shaded internally with bright yellow and pale red. *Bracts* linear; *Wings* of the seed like brown; the long one russet. *Leaves* opposite, egg-oblong, pointed. *Petioles* short. *Stipules* linear, soft, three or four to each petiol. Two *glands* at the base of each leaf. *Stem* pale brown, ringed at the insertion of the leaves, downy.

This was the favourite plant of *Sacontala*, which she very justly called the *Delight of the Woods;* for the beauty and fragrance of its flowers gave them a title to all the praises which *Ca'lida's* and *Jayadéva* bestow on them: it is a gigantic and luxuriant climber; but, when it meets with nothing to grasp, it assumes the form of a sturdy tree, the highest branches of which

display, however, in the air their natural flexibility and inclination to climb. The two names, *Vásanti* and *Mádhavi*, indicate a *vernal* flower; but I have seen an *Atimucta* rich both in blossoms and fruit on the first of *January*.

46. *Amrátaca:*
Syn. Pítana, Capítaná.
Vulg. Ámdá, pronounced *Ámra*, or *Ámlá.*
Linn. Spondias Myrobalan β, or a new species.

The *natural character* as in *Linnæus*. *Leaves* feathered with an odd one; *leaflets*, mostly five-paired, egg-oblong, pointed, margined, veined, nerved; *common petiol* smooth, gibbous at the base. *Flowers* raceme-panicled, yellowish white. *Fruit* agreeably acid; thence used in cookery. *Van Rheede* calls it *Ambadò* or *Ambalam*; and, as he describes it with *five* or *six* styles, it is wonderful that *Hill* should have supposed it a *Chrysobalanus*.

47. *Hémasagára*, or *the Sea of Gold.*
Vulg. Himsagar.
Linn. Jagged-leaved *Cotyledon.*
Cal. Perianth four-cleft; *divisions* acute.
Cor. One-petaled: *Tube* four-angled, larger at the base; *border* four-parted: *divisions* egged, acute. *Nectary* one, minute, concave scale at the base of each germ.
Stam. Filaments eight, adhering to the tube; *four* just emerging from its mouth; *four* alternate, shorter. *Anthers* erect, small, furrowed.
Pist. Germ. four, conical. *Styles*, one from each germ, awled, longer than the filament. *Stigmas* simple.
Per. Capsules four, oblong, pointed, bellied, one valved, bursting longitudinally within.
Seeds numerous, minute.

Panicles terminal. *Flowers* of the brighest gold-colour. *Leaves* thick, succulent, jagged, dull sea-green. *Stem* jointed, bending, in part recumbent. This plant flowers for many months annually in *Bengal:* in one blossom out of many, the numbers were *ten* and *five;* but the filaments alternately long and short.

48. *Madhúca;*
Syn. Gurapushpa, Madhudruma, Vánaprast'ha, Madhusht'hila, Madhu.
Vulg. Maiiyála, Mahuyá, Mahwá.
Linn. Long-leaved *Bassia.*

49. *Cahlára*:*
Syn. Saugandhica, or *Sweet-scented.*
Vulg. Sundhí-hálá, or *Sundhí-hálá-náli.*
Linn. Nymphœa Lotos.
Calyx as in the genus.
Cor. Petals fifteen, lanced, rather pointed and keeled; the exterior series green without, imitating an interior calyx.
Stam. Filaments more than forty; below, flat, broad; above, narrow, channelled within, smooth without; the outer series erect, the inner somewhat converging. *Anthers* awled, erect; some coloured like the petals.
Pist. Germ large, orbicular, flat at the top, with many (often seventeen) furrows externally, between which arise as many processes, converging towards the *stigma;* the disk marked with as many furrowed rays from the centre, uniting on the margin with the converging processes. *Stigma* round-

* According to the sacred Grammar, this word was written *Cahlhára,* and pronounced as *Callara* would be in ancient British. * When the flowers are red, the plant is called *Hallaca* and *Racta sandhaca.*

ish, rather compressed, sessile in the centre of the disk, permanent.

Per. *Berry* in the form of the *germ* expanded, with sixteen or seventeen cells.

Seeds very numerous, minute, roundish. *Flowers* beautifully azure, when full blown more dilated; less fragrant than the red, or rose-coloured, but with a delicate scent. *Leaves* radical, very large, subtargeted, hearted, deeply scollop-toothed. On one side dark purple, reticulated; on the other dull green, smooth. *Petioles* very smooth and long, tubular. The seeds are eaten, as well as the bulb of the root, called *Sálúca;* a name applied by *Rheede* to the whole plant, though the word *Camala*, which belongs to another *Linnæan* species of *Nymphœa*, be clearly engraved on his plate in *Nágarì* letters. There is a variety of this species with leaves purplish on both sides; flowers dark crimson, calycine petals richly coloured internally, and anthers flat, furrowed, adhering to the top of the filaments: the petals are more than fifteen, less pointed, and broader than the blue, with little odour.

The true Lotos of *Egypt* is the *Nymphœa Nílifer*, which in *Sanscrit* has the following names or epithets: *Padma*, *Nalina*, *Aravinda*, *Mahotpala*, *Camala*, *Cuséshaya*, *Sahasrapatra*, *Sárasa*, *Pancéruha*, *Támarasa*, *Sarasíruha*, *Rájíva*, *Visáprasúna*, *Pushcara*, *Ambhóruha*, *Sctapatra*. The new-blown flowers of the rose-coloured *Padma*, have a most agreeable fragrance: the white and yellow have less odour: the blue, I am told, is a native of *Cashmír* and *Persia*.

50. *Campaca:*
Syn. *Chámpéya, Hémapushpaca.*
Vulg. *Campac, Champá.*
Linn. *Michelia.*

The delineation of this charming and celebrated plant, exhibited by *Van Rheede*, is very correct, but rather on too large a scale: no material change can be made in its *natural character* given by *Linnæus:* but, from an attentive examination of his two *species*, I suspect them to be *varieties* only, and am certain that his trivial names are merely different ways of expressing the same word. The strong aromatic scent of the gold-coloured *Campac*, is thought offensive to the bees, who are never on its blossoms; but their elegant appearance on the black hair of the *Indian* women is mentioned by *Rumphius;* and both facts have supplied the *Sanscrit* poets with elegant allusions. Of the wild *Campac*, the leaves are lanced, or lance-oblong; the three leaflets of the *calyx* green, oval, concave; the *petals* constantly six, cream-coloured, fleshy, concave, with little scent; the three *exterior* inverse-egged; the three *interior* more narrow, shorter pointed, converging; the *anthers* clubbed, closely set round the base of the imbricated *germs*, and with them forming a cone; the *stigmas* minute, jagged.

Both Mr. *Marsden* and *Rumphius* mention the blue *Campac* as a rare flower, highly prized in *Sumatra* and *Java;* but I should have suspected that they meant the *Kæmperia Bhúchampac*, if the *Dutch* naturalist had not asserted that the plant which bore it was a tree resembling the *Campaca* with yellow blossoms: he probably never had seen it; and the *Bráhmins* of this province insist, that it flowers only in paradise.

51. *Dévadá'ru:*
Syn. Sacrapá'dapa, Pá'ribhadraca; Bhadradá'ru, Duhcilima, Pítadá'ru, Dá'ru, Púticash't'ha.
Vulg. Dévadá'r.
Linn. Most lofty Unona.

52. *Parnása:*
Syn. Tulasí, Cat'hinjara, Cut'héraca; Vrindá.
Vulg. Tulosì, Talsi.
Linn. Holy Ocymum?

The Natural Character as in Linnæus.

See 10 H. M. p. 173.

It is wonderful that *Rheede* has exhibited no delineation of a shrub so highly venerated by the *Hindus*, who have given one of its names to a *sacred* grove of their *Parnassus* on the banks of the *Yamunà*; he describes it however, in general terms, as resembling another of his *Tolassis* (for so he writes the word, though *Tulasí* be clearly intended by his *Na'garì* letters); and adds, that *it is the only species reputed holy, and dedicated to the god Vishnu.* I should, consequently, have taken it for the *Holy Ocymum* of *Linnæus*, if its odour, of which that species is said to be nearly destitute, had not been very aromatic and grateful; but it is more probably a variety of that species than of the *Small-flowered*, which resembles it a little in fragrance. Whatever be its *Linnæan* appellation, if it have any, the following are the only remarks that I have yet had leisure to make on it.

Stem one or two feet high, mostly incurved above; knotty and rough below. *Branchlets* cross-armed, channelled. *Leaves* opposite, rather small, egged, pointed, acutely sawed; purple veined beneath, dark above. *Petioles* dark purple, downy. *Racemes* terminal; *Flowers* verticilled three-fold or five-fold, cross-armed, *verticils* from seven to fourteen. *Peduncles* dark purple, channelled, villous; *Bracts* sessile, roundish, concave, reflected. *Calyx* with its upper lip orbicular, deeply concave externally. *Corol* bluish purple. The whole plant has a dusky

purplish hue, approaching to *black*, and thence, perhaps, like the large *black bee* of this country, it is held sacred to *Crishna*; though a fable, perfectly *Ovidian*, be told in the *Puranas* concerning the metamorphosis of the nymph *Tulasi*, who was beloved by the pastoral God, into the shrub, which has since borne her name. It may not be improper to add, that the *White Ocymum* is in *Sanscrit* called *Arjaca*.

53. *Pátali:*

Syn. Pátala, Amóghá, Cáchast'háli, P'haléruha, Crishnavrintà, Cuvérachì. Some read *Móghá* and *Cálást'háli.*

Vulg. Páralá, Pàrali, Pa'rul.

Linn. Bignonia. Chelonoides?

Cal. Perianth one-leaved, belled, villous, withering, obscurely five-angled from the points of the divisions, five-parted; *divisions* roundish, pointed, the two lowest most distant.

Cor. One-petaled, belled. *Tube* very short; *throat* oblong-belled, gibbous. *Border* five-parted, the *two higher* divisions reflected, each minutely toothed; convex externally; the *three lower* divisions, above, expanded; below, ribbed, furrowed, very villous. *Palate* nearly closing the throat. *Nectary*, a prominent rim, surrounding the germ, obscurely five-parted.

Stam. Filaments four *or five*, incurved, inserted below the *upper* division of the border, shorter than the corol, with the *rudiment* of a fifth or sixth, between two shorter than the rest. *Anthers* two-cleft, incumbent at obtuse angles.

Pist. Germ oblong-conical. *Style* thread-form, as long as the stamens. *Stigma* headed with two folds, often closed by viscidity.

Per. Capsule one-celled, two-valved, twelve inches long at a medium, and one inch thick; rounded,

four-sided, pointed, incurved, rather contorted, diminished at both ends, dotted with ashy specks, here and there slightly prominent, striated; two stripes broader, very dark, at right angles with the valves.

Rac. A series of hard, broadish, woody rings, closely strung on two wiry central threads.

Seeds numerous, *forty-eight* on an average, three angled, inserted by one angle in cavities between the rings of the receptacle, into which they are closely pressed by parallel ribs in the four sides of the capsule; winged on the two other angles with long sub-pellucid membranes, imbricated along the sides of the receptacle.

Tree rather large. *Stem* scabrous.

Branchlets cross-armed, yellowish green, speckled with small white lines. *Leaves* feathered with an odd one; two or three paired, petioled. *Leaflets* opposite, egged, pointed, most entire, downy on both sides, veined; older leaflets roughish, margined, netted and paler below, daggered. *Petioles* tubercled, gibbous at the base; of the paired leaflets, very short; of the odd one, longer. *Stipules* linear. *Flowers* panicled; *pedicles* opposite, mostly three-flowered; an odd flower subsessile between the two terminal pedicles. *Corol*, externally, light purple above, brownish purple below, hairy at its convexity; internally dark yellow below, amethystine above; exquisitely fragrant, preferred by the bees to all other flowers; and compared by the poets to the quiver of *Cámadéva*, or the God of Love. The whole plant, except the *root* and *stem*, very downy and viscid. The fruit can scarce be called a *silique*, since the seeds are no where affixed to the sutures; but their *wings* indicate the genus, which might properly have been named *Pterospermon:* they are very hard, but enclose a white sweet kernel; and their light-coloured summits with three dark points,

give them the appearance of the winged insects. Before I saw the fruit of this lovely plant, I suspected it to be the *Bignonia Chelonoides*, which *Van Rheede* calls *Pa'dri;* and I conceived that barbarous word to be a corruption of *Pa'tali;* but the pericarp of the true *Pa'tali*, and the form of the seeds, differ so much from the *Pa'dri*, that we can hardly consider them as *varieties* of the same species; although the specific character exhibited in the Supplement to *Linnæus*, corresponds very nearly with both plants.

The *Pa'tali* blossoms early in the spring, before a leaf appears on the tree, but the fruit is not ripe till the following winter.

54. *Gócant'aca:*

Syn. Palancáshá, Icshugandhá, Swadanshtrá, Swaducant'aca, Gócshuraca, Vanasrnigáta.

Vulg. Gócshura, Gókyura, Culpì,

Rheede: Bahél Chulli.

Linn. Long-leaved *Barleria?*

Cal. Perianth one-leaved, hairy, five-toothed; *upper*-tooth long, incurved, pointed; two *under* and two lateral shorter, subequal, winged with sub-pellucid membranes.

Cor. One petaled, two-lipped. *Tube* flattish, curved, protuberant at the mouth. *Upper* lip erect, two-parted, reflected at the sides, concave in the middle, enclosing the fructification. *Under* lip three-parted, reflected, with two parallel, callous, hispid bodies on the centre of its convexity; *Divisions* inverse-hearted.

Stam. Filaments four, inserted in the mouth of the tube; connected at their base, then separated into pairs, and circling round the pistil; each pair united below, consisting of a *long* and *short* filament. *Anthers* arrowed.

Pist. Germ awled, pointed, furrowed, with prominent seedlets, sitting on a glandular pedicel. *Style* thread-form, longer than the stamens, incurved above them. *Stigma* simple.

Per.

Flowers verticilled; *Corols* blue, or bright violet; centre of the *under* lip yellow. *Verticils*, each surrounded by six *thorns*, very long, diverging, coloured above; under which are the *leaves*, alike verticilled, lanced, acutely sawed, pubescent, interspersed with bristles. *Stem* jointed, flattish, hairy, reddish; furrowed on both sides; broader at the joints, or above the verticils; *furrows* alternate.

55. *Sindhuca.*

Syn. Sindhuvá'ra, Indrasurisa, Nirvandì, Indránicà.

Vulg. Nis'andà.

Linn. Three-leaved *Vitex*, or *Negundo?*

Cal. Perianth five-toothed, beneath, permanent; *toothlets* acute, subequal.

Cor. One-petaled, grinning; *Tube* funnel-shaped, internally villous; *border* two-lipped; *upper* lip broad concave, more deeply coloured; *under* lip four cleft; *divisions* acute, similar.

Stam. Filaments four; *two* shorter, adhering to the *Tube*, villous at the base. *Anthers* half-mooned.

Pist. Germ globular; *Style* thread-form; *Stigma* two-parted, pointed, reflex.

Per, Berry (unless it be the coat of a naked seed) roundish, very hard, black, obscurely furrowed, with the calyx closely adhering.

Seeds from one to four? I never saw more than one, as *Rheede* has well described it.

Flowers raceme-panicled; purplish or dark blue without, greyish within, small. *Racemes* mostly terminal; some pedicles many flowered.

Stem distinctly four-sided; *sides* channelled, jointed, bending. *Stipules* egged, scaly, thickish, close. *Branchlets* cross-armed.

The *tube* of the corol is covered internally with a tangle of silvery silky down, exquisitely beautiful; more dense below the *upper* lip.

This charming shrub, which seems to delight in watery places, rises to the height of ten or twelve, and sometimes of twenty feet; exhibiting a most elegant appearance, with rich racemes or panicles lightly dispersed on the summit of its branchlets. On a comparison of two engravings in *Rumphius*, and as many in *Van Rheede*, and of the descriptions in both works, I am nearly persuaded that the *Sindhuca*, or *Nirgandhi*, is the *Vitex Negundo* of *Linnæus:* but it certainly resembles the *three-leaved Vitex* in its *leaves*, which are opposite, egged, acute, petioled; above mostly *three'd*, below mostly *fived*; paler beneath; rarely sawed and very slightly, but generally entire: they are very aromatic, and pillows are stuffed with them, to remove a cold in the head and a headach occasioned by it. These, I presume, are the shrubs which *Bontius* calls *Lagondi*, and which he seems to consider as a panacea.

56. *Cáravélla.*
Syn. Cátillaca, Sushavi.
Vulg. Beng. *Hurhuriya: Hind. Carailá.*
Linn. Five-leaved *Cleome?*
Cal. Perianth four-leaved, gaping at the base, then erect; *leaflets* egg-oblong, concave, downy, deciduous.
Cor. Cross-form. *Petals* four, expanding, *claws* long; *folds* wrinkled.
Nectary, from *six* to *twelve* roundish perforated *glands*, girding the gibbous *receptacle.*

Stam. Filaments six, thread-form, hardly differing in length, inserted on a pedicel below the germ. *Anthers* erected, pointed, furrowed.

Pist. Germ erect, linear, long, downy, sitting on the produced pedicel. *Style* very short. *Stigma* headed, flat, circular.

Per. Silique one-celled, two-valved, spindle-shaped, with protuberant seeds; *crowned with the* permanent style.

Seeds very many, roundish, nodding. *Receptacles* linear, often more than two.

The whole plant most distinctly one piece. *Root* whitish, with scattered capillary fibres. *Stem* herbaceous, pale green, in parts purple, hairy, cross-armed, produced into a long *raceme* crowded at the summit. *Branchlets* similiar to the stem, leaf-bearing; similar, but smaller leaves rising also from their axils. *Leaves* fived, roundish-rhomboidal, notched, pointed, hairy, dark green, the lower pairs respectively equal, the odd one much larger, strongly ribbed with processes from the petiol-branchlets, conjoined by the bases of the ribs, in the form of a starlet; each ray whitish and furrowed within. *Calyx* green. *Petals* white. *Anthers* covered with gold-coloured pollen. *Pedicels* purplish. *Bracts* three'd, similar to the cauline leaves. The sensible qualities of this herb seem to promise great antispasmodic virtues; it has a scent much resembling *assa-fœtida*, but comparatively delicate and extremely refreshing. For pronouncing this *Cleome* or *Cleonella* of the ancient *Indians*, I have only the authority of *Rheede*, who has exactly written the word in *Malabar* letters. As to the *Bráhmanical* name *Vilóni*, my vocabularies have nothing more like it than *Tilaca*, to which *Cshuraca* and *Srímat* are the only synonyma.

57. *Nágacésara:*
Syn. Chámpéya, Césara; Cánchana, or any other name of *gold.*
Vulg. Nagafar.
Linn. *Iron Mesua.*

To the botanical descriptions of this delightful plant, I need only add, that the tree is one of the most delightful on earth, and that the delicious odour of its blossoms justly gives them a place in the quiver of *Cámadéva.* In the poem called *Naishadha,* there is a wild but elegant couplet, where the poet compares the white of the *Nágacésara,* from which the bees were scattering the pollen of the numerous gold-coloured anthers, to an alabaster-wheel, on which *Cáma* was whetting his arrows, while sparks of fire were dispersed in every direction. Surely, the genuine appellation of an *Indian* plant should not be substituted for the corrupted name of a *Syrian* physician, who could never have seen it: and, if any trivial name were necessary to distinguish a single species, a more absurd one than *iron* could not possibly have been selected for a flower with petals like silver, and anthers like gold.

58. *Sálmali:*
Syn. *Pich'hilá, Páronì, Móchá, St'hiráyush.*
Vulg. *Semel.*
Linn. Seven-leaved *Bombax.*

59. *San'a:*
Syn. *Sanápushpicá, Ghant'árava.*
Vulg. *San,* pronounced *Sun.*
Linn. Rushy *Crotalaria.*
Cal. *Perianth* one-leaved, villous, permanent; short below, gibbous on both sides, with minute linear tracts. *Upper teeth* two, lanced, pressing the banner; *lower* tooth boat-form, concave, two-gashed

in the middle, cohering above and below, sheathing the keel, rather shorter than it; pointed.

Cor. Boat-form.

Banner broad, large, acute, rather hearted, with two dark callosities at the base, and with compressed sides, mostly involving the other parts: a dark line from base to point.

Wings inverse-egg-oblong, with dark callous bodies at their axils, two-thirds of the banner in length.

Keel flattened at the point, nearly closed all round to include the fructification; very gibbous below, to receive the germ.

Stam. Filaments ten, coalesced, cleft behind, two-parted below; alternately short with linear furrowed erect, and long with roundish *anthers*.

Pist. Germ rather awled, flat, villous, at a right angle with the ascending, cylindric, downy *Style*. *Stigma* pubescent, concave, open, somewhat lipped.

Per. Legume pedicelled, short, velvety, turgid, one-celled, two-valved.

Seeds, from one or two to twelve or more, round kidney-form, compressed.

Flowers deep yellow. *Leaves* alternate, lanced, paler beneath, keeled; *petioles* very short; *stipules* minute, roundish, villous. *Stem* striated.

Threads, called *pavitraca*, from their supposed *purity*, have been made of *Sana* from time immemorial: they are mentioned in the laws of *Menu*.

The *retuse-leaved Crotalaria*, which *Van Rheede* by mistake calls *Schama Puspi*, is cultivated, I believe, for the same purpose. *Rumphius* had been truly informed that thread for nets were made from this genus in *Bengal;* but he suspected the information to be erroneous, and thought that the persons who conveyed it had confounded the *Crotalaria* with the *Capsular Corchorus*. Strong ropes and canvas are made of its macerated bark.

The *Jangalsan*, or a variety of the *watery Crotalaria*, has very beautiful flowers, with a greenish white banner, purple striped, wings bright violet: *stem* four-angled, and four-winged; *leaves* egged, obtuse, acute at the base, curled at the edges, downy; *stipules* two, declining, mooned, if you chuse to call them so, but irregular, and acutely pointed. In all the *Indian* species, a difference of soil and culture occasion varieties in the flower and fructification.

60. *Jayantì:*
Syn. Jayá, Tercárì, Nádéyì, Vaijayruticá.
Vulg. Jainti, Jáhì; some say, *Aranì.*
Rheede: Kedangu.
Linn. Oeschynomene Sesban.
Cal. Perianth one-leaved, rather belled, five-cleft; *toothlets* awled, erect, sub-equal, more distant on each side of the awning; permanent.
Cor. Boat-form.
Awning very broad, rather longer than the wings, inverse-hearted, quite reflected so as to touch the calyx: waved on the margin; furrowed at the base internally, with two converging hornlets fronting the aperture of the keel, gibbous below, awled upwards, acute, erect, within the wings. *Wings* oblong, clawed, narrower above, obtuse, spurred below, embracing the keel and the hornlets of the awning.
Keel compressed, enclosing the fructification, inflected nearly in a right angle, gashed below and above the flexure; each division hatchet-form; beautifully striated.
Stam. Filaments simple and nine-cleft, inflected like the keel; the *simple* one curved at the base. *Anthers* oblong, roundish.
Pist. Germ compressed, linear, erect as high as the

flexure of the filaments with visible partitions. *Style* nearly at a right angle with the germ, awled, inflected like the stamen. *Stigma* rather headed, somewhat cleft, pellucid.

Per. *Legume* very long, slender, wreathed when ripe, smooth at the valves, but with seeds rather protuberant, many-parted, terminated with a hard sharp point.

Seeds oblong, rather kidney-shaped, smooth, slightly affixed to the suture, solitary.

Stem arborescent, rather knotty. *Leaves* feathered, pairs from nine to fifteen, or more, often alternate; *leaflets* oblong, end-nicked, some with an acute point, dark green above, paler beneath, with a gibbosity at the insertion of the petiols; sleeping, or collapsing, towards night. *Racemes* axillary; *pedicels* with a double curvature or line of beauty; *flowers* small, six or seven; varying in colour; in some plants, wholly yellow; in others, with a blackish-purple awning yellow within, and dark yellow wings tipped with brown; in some with an *awning* of the richest orange scarlet externally, and internally of a bright yellow; *wings* yellow, of different shades; and a keel pale below, with an exquisite changeable light purple above, striated in elegant curves. The whole plant is inexpressibly beautiful, especially in the colour of the buds and leaves, and the grace of all the curves, for there is no proper angle in any part of it. The *Bráhmins* hold it sacred: *Van Rheede* says, that they call it *Cananga*; but I never met with that word in *Sanscrit*: it has parts like an *Hedysarum*, and the air of *Cytisus*.

61. *Palása*:
Syn. *Sinsúca*, *Parna*, *Vátápot'ha*.
Vulg. *Pálas Plás Dhác*.
Koen. *Butea* frondosa.

Cal. Perianth belled, two-lipped *upper* lip broader, obscurely end-nicked; *under* lip three-cleft, downy; permanent.

Cor., Boat-form.

Awning reflected, hearted, downy beneath; sometimes pointed.

Wings lanced, ascending, narrower than the keel.

Keel as long as the wings, two-parted below, half-mooned, ascending.

Stam. Filaments nine and one, ascending, regularly curved. *Anthers* linear, erect.

Pist. Germ pedicelled, oblongish, downy.

Style awled, about as long as the stamens. *Stigma* small, minutely cleft.

Per. Legume pedicelled, oblong, compressed, depending.

Seed one, toward the apex of the pericarp flat, smooth, oval-roundish.

Flowers raceme-fascicled, large, red, or *French* scarlet, silvered with down.

Leaves three'd, petioled; *leaflets* entire, stipuled, large, rhomboidal; the *lateral* ones unequally divided; the *terminal* one larger, equally bisected, brightly verdant. A *perfect* description of the *arborescent* and the *twining Palása* has been exhibited in the last volume, with a full account of its beautiful red *gum*; but the same plant is here shortly described from the life, because few trees are considered by the *Hindus* as more venerable and holy. The *Palása* is named with honour in the *Védas*, in the laws of *Menu*, and in *Sanscrit* poems, both sacred and popular; it gave its name to the memorable *plain* called *Plássey* by the vulgar, but properly *Palási*; and, on every account, it must be hoped that this noble plant will retain its ancient and classical appellation. A grove of *Palásas* was formerly the principal ornament of *Crishna-nagar* where we still see the trunk of an

aged tree near six feet in circumference. This genus, as far as we can judge from written descriptions, seems allied to the *Nissolia*.

62. *Caranjaca.*
Syn. Chirabilva, Nactamála Caraja.
Vulg. Caranja.
Rheede. Caranschi, 6 H. M. tab. 3.
Cal. Perianth one-leaved, cup-form, obscurely five-toothed, or scalloped, beaked.
Cor. Boat-form.
Awning broad, end-nicked, striated, rather spirally inflected, with two callosities at its base.
Wings oblong, of the same length with the awning.
Keel rather shorter, gibbous below, two-parted.
Stam. Filaments nine in one body, gaping at the base, and discovering a tenth close to the style. *Anthers* egged, erect.
Pist. Germ above, oblong, downy. *Style* incurved at the top. *Stigma* rather headed.
Per. Legume mostly one-seeded, thick, rounded above, flattish, beaked below.
Seed oblong-roundish, rather kidney-form.
Racemes axillary. *Awning* pale; *wings* violet. *Leaves* feathered with an odd one, mostly two-paired; *leaflets* egg-oblong, pointed, keeled, short petioled; brownish on one side, pale on the other. *Common petiol* gibbous at its base. The *seed* yields an oil supposed to be a cure for the most inveterate scabies.

63. *Arjuna:*
Syn. Nadisarja, Vírataru, Indradru, Cacubha.
Vulg. Jaral.
Rheede. Adamboe; 4 H. M. *tab.* 20, 21, 22,
Linn. Beautiful Munchhausia?
Koen. Queen's Flower Lagerstroemia?
Cal. Perianth one-leaved, six-cleft, top-shaped, fur-

rowed with protuberant ridges, downy, permanent; *divisions* coloured, with points reflected.

Cor. Petals six, roundish, somewhat notched, expanding, wavy; *claws* short, inserted in the calyx.

Stam. Filaments coloured, numerous, capillary, shortish, obscurely conjoined in six parcels, one to each *division* of the calyx: *anthers* thick, incumbent, roundish, kidney-shaped.

Pist. Germ above, egged. *Style* coloured, longish, thread-form, incurved. *Stigma* obtuse.

Per. Capsule egged, six celled, six-valved.

Seeds numerous.

Panicles racemed, terminal, erect. *Flowers* violet or light purple, in the highest degree beautiful. *Leaves* alternate, leathery, some opposite, egg-oblong, stipuled, most entire, short petioled, smooth, paler beneath. *Branches* round and smooth. I have seen a single panicle waving near the summit of the tree, covered with blossoms, and as large as a milk-maid's garland. The *timber* is used for the building of small boats.

64. *Vandá:*

Syn. Vricshádanì, Vricsharhua, Jívanticá.

Vulg. Bándà, Persárà, Perasárà.

These names, like the *Linnæan*, are applicable to all *parasite*-plants.

Linn. Retuse-leaved *Epidendrum?*

Cal. Spathes minute, straggling.

Cor. Petals five, diverging, oval-oblong, obtuse, wavy; the two lowest larger; the three highest equal, bent towards the nectary.

Nectary central, rigid: *mouth* gaping, oblique: *Upper lip* shorter, three-parted, with a polished honey-cup; *under lip* concave in the middle, keeled above, with two smaller cavities below, two processes at the *base*, incurved, hollow, oval-pointed, converging, honey-bearing.

Stam. Filaments very short. *Anthers* round, flattish, margined, covered with a lid, easily deciduous from the *upper* lip of the nectary.

Pist. Germ beneath long, ribbed, contorted with curves of opposite flexure. *Style* very short, adhering to the *upper* lip. *Stigma* simple.

Per. Capsule oblong-conic, wreathed, six-keeled, each with two smaller keels, three-celled, crowned with the dry corol.

Seeds innumerable, like fine dust, affixed to the *receptacle* with extremely fine hairs, which become thick wool.

Scapes incurved, solitary, from the cavity of the leaf, at most seven-flowered; pedicels alternate. *Petals* milk-white externally, transparent; brown within, yellow-spotted. *Upper* lip of the nectary snow-white; *under* lip rich purple, or light crimson, striated at the base, with a bright yellow gland, at it seems, on each process. The flowers gratefully fragrant and exquisitely beautiful, looking as if composed of shells, or made of enamel; crisp elastic, viscid internally. *Leaves* sheathing, opposite, equally curved, rather fleshy, sword-form, retuse in two ways at the summit, with one acute point. *Roots* fibrous, smooth, flexible; shooting even from the top of the leaves. This lovely plant attaches itself chiefly to the highest *Amras* and *Bilvas;* but it is an air-plant, and lives in a pot without earth or water: its leaves are excavated upwards, to catch and retain dew. It most resembles the first and second *Maracuras* of *Van Rheede* in its roots, leaves, and fruit; but rather differs from them in its inflorescence. Since the parasites are distinguished by the trees on which they most commonly grow, this may in *Sanscrit* be called *Amaravandà;* and the name *Boculavandà* should be applied to the *Loranthus;* while the *Viscum* of the oak, I am told, is named *Vandà* sim-

ply and transcendantly, the *Vandáca*, or oak, being held sacred.

65. *Á'malací:*
Syn. Tishyap'halá, Amritá, Vayast'há.
Vulg.
Linn. Phyllanthus Emblicá.

66. *Gajapippalí:*
Syn. Caripippalí, Capiballi, Colaballi, Sreyasi, Vasira. Some add, *Chaviçá*, or *Chavya;* but that is named in the *Amaracósh* as a distinct plant, vulgarly *Chava*, or *Chayi.*
Vulg. Pippal-j'hança, Maidalí.

MALE FLOWERS.

Cal. Common Perianth four-leaved; *leaflets* roundish, concave; the two exterior, opposite, smaller, containing from *eight* to *fourteen* florets. *Partial calyx*, none.
Cor. None. *Nectary*, many yellow glands on the pedicel of the filaments.
Stam. Filaments from eight to eighteen in each floret, connected by a short villous pedicel, thread-form, very hairy. *Anthers* large netted, irregular, inflated, containing the pollen.
Pist. Rudiments of a *germ* and *style* withering.

FEMALE FLOWERS.

Cal. Common Perianth as in the male, but smaller; containing from ten to twelve florets.
Partial calyx none, unless you assume the corol.
Cor. many-petaled, bellied. *Petals* erect lance-linear, fleshy, covered within, and externally with white hairs. *Nectary*, yellow glands sprinkling the receptacle.

Pist. Germ. oval. *Style* cylindric, curved at the base. *Stigma* headed.
Per. Berry globular, one-seeded.
Seed spherical, smooth.
Flowers umbelled, yellow from their anthers. *Leaves* mostly oblong-lanced, but remarkably varying in shape, alternate. Both flowers and fruit have an agreeable scent of lemon-peel; and the berries, as a native gardener informs me, are used as a spice or condiment. It was from him that I learned the *Sanscrit* name of the plant; but as *ballì* means a *creeper*, and as the *Pippal-j'hanca*, is a tree perfectly able to stand without support, I suspect in some degree the accuracy of his information; though I cannot account for his using a *Sanscrit* word without being led to it, unless he had acquired at least traditional knowledge. It might be referred, from the imperfect mixed flower, to the twenty-third class.

67. *Sácótáca*;
Syn.
Vulg. Sy'ura, or *Syaura.*
Koen. Rough-leaved, Trophis?

MALE.

Cal. Common imbricated; *leaflets* six or eight, egged, acute, small, expanding, withering, containing generally from five to seven flowerets. *Partial* four-parted; *divisions* egged, expanded, villous.
Cor. None, unless you assume the calyx.
Stam. Filaments mostly four (in some, three; in one, five,) awled, fleshy, rather compressed, spreading over the divisions of the calyx, and adhering to them at the point. *Anthers* double, folded.
The *buds* elastic, springing open on a touch.

FEMALE.

Cal. Four-parted: *divisions* egged, concave, pointed, permanent, propped by two small *bracts;* unless you call them the calyx.
Cor. None; unless you give the *calyx* that name.
Pist. Germ roundish. *Style* very short, cylindric. *Stigma* long, two-parted, permanent.
Per. Berry one-seeded, navelled, smooth, somewhat flattened.
Seed globular, arilled.
Leaves various, some inverse-egged, some oblong, some oval, pointed, irregularly notched, alternate (some opposite) crowded, crisp, very rough veined, and paler beneath, smoother and dark above. *Berry,* deep yellow. The *Pandits* having only observed the *male* plant, insist that it bears no fruit. *Female* flowers axillary, from one to four or five in an axil.

68. *Virana:*
Syn. Viratara.
Vulg. Béná Gándár Cata.
Retz. Muricated Andropogon.
Roxb. Aromatic Andropogon.

The root of this useful plant, which *Cálidás* calls *Us'íra* has nine other names, thus arranged in a *Sanscrit* verse:

Abhaya, Nalada, Sévya Amrinála, Jalás'aya,
Lámajjaca, Laghulaya, Avada'ha, Ishtacápat'ha.

It will be sufficient to remark, that *Jálas'aya* means *aquatic,* and that *Avadáha* implies a power of *allaying feverish heat;* for which purpose the root was brought by *Gautamí* to her pupil *Sacontalá.* The slender

fibres of it, which we know here by the name of *C'has* or *Khaskas*, are most agreeably aromatic when tolerably fresh; and, among the innocent luxuries of this climate, we may assign the first rank to the coolness and fragrance which the large hurdles or screens in which they are interwoven, impart to the hottest air, by the means of water dashed through them; while the strong southern winds spread the scent before it, and the quick evaporation contributes to cool the atmosphere. Having never seen the fresh plant, I guessed, from the *name* in *Van Rheede* and from the *thin roots*, that it was the *Asiatic Acarus:* but a drawing of Dr. *Roxburgh's* has convinced me that I was mistaken.

69. *Sami.*
Syn. Sactu-p'halá, Siva.
Vulg. Sáën, Bábul.
Linn. Farnesian Mimosa.
Thorns double, white, black pointed, stipular. *Leaves* twice feathered; first, in three or four pairs, then in pairs from fourteen to sixteen. *Spikes* globular, with short peduncles; *yellow*, perfuming the woods and roads with a rich aromatic odour. A minute *gland* on the petiols below the leaflets. *Wood* extremely hard, used by the *Bráhmins* to kindle their sacred fire, by rubbing two pieces of it together, when it is of a proper size and sufficiently dried. *Gum* semi-pellu[illegible] *Legumes* rather spindle-shaped, but irregular[illegible]ved, acutely pointed, or daggered, with twelve or fourteen seeds rather prominent, gummy within. *Seeds* roundish, compressed. The gum of this valuable plant is more transparent than that of the *Nilotic* or *Arabian* species; which the *Arabs* call *Ummu'l-ghílán*, or Mother of Serpents; and the *Persians*, by an easy corruption, *Mughílán*.

Samíra means a small *Samí;* but I cannot learn to what species that diminutive form is applied.

Lajja'ru (properly *Lajja'lu)* signifies *bashful*, or *sensitive*, and appears to be the word engraved on a plate in the *Malabar* Garden; though *Van Rheede* pronounces it *Lauri*. There can be no doubt that it is the *swimming Mimosa*, with *sensitive* leaves, root inclosed in a spungy cylinder, and flowerets with only ten filaments *Linnæus*, by a mere slip, has referred to this plant as his *Dwarf Oeschynomene;* which we frequently meet with in *India*.—See 9 H. M. tab. 20. The epithet *Lajja'lu* is given by the *Pandits* to the *Modest Mimosa*.

70. *Chandrica:*

Syn Chandrapushpa.

Vulg. Ch'hóta Cha'nd, or *Moonlet*.

Rheede: Sjouanna Amelpodi. 6 H. M. t. 47.

Linn. Serpent Ophioxylum.

Cal. Perianth five-parted, small, coloured, erect, permanent: *divisions* egged, acutish.

Cor. Petal, one. *Tube* very long in proportion; jointed near the middle, gibbous from the enclosed anthers; above them, rather funnel-form. *Border* five-parted; *divisions* inverse-egged, wreathed.

Pist. Germ above, roundish. *Style* thread-form. *Stigma* irregularly headed; with a circular pellucid base, or *nectary*, extremely viscid.

Per. Berry mostly twined, often single, roundish, smooth, minutely pointed, one-seeded.

Seed on one side flattish, or concave; on the other, convex.

Flowers fascicled. *Bracts* minute, egged, pointed, coloured. *Tube* of the corol light purple; *border* small, milk-white. *Calyx*, first pale pink, then bright carmine. *Petiols* narrow-winged. *Leaves*

oblong-oval, pointed, nerved, dark and glossy above, mostly three-fold, sometimes paired, often four-fold near the summit; *margins* wavy. Few shrubs in the world are more elegant than the *Chandra*, especially when the vivid carmine of the *perianth* is contrasted not only with the milk-white corol, but with the rich green *berries*, which at the same time embellish the fascicle: the mature berries are black, and their pulp light purple. The *Bengal* peasants assure me, as the natives of *Malabar* had informed *Rheede*, that the *root* of this plant seldom fails to cure animals bitten by snakes, or stung by scorpions; and, if it be the plant, supposed to assist the *Nacula*, or *Viverra Ichneumon*, in his battles with serpents, its *nine* synonyma have been strung together in the following distich:

Náculí, Surasá, Rásná, Sugandá Gandhanáculi
Náculéshtá, Bhujangácshí, Ch'hatricá, Suvaha, nava.

The vulgar name, however, of the ichneumon-plant is *Rásan;* and its fourth *Sanscrit* appellation signifies *well-scented:* a quality which an ichneumon alone could apply to the *Ophioxylum;* since it has a strong and rather fœtid odour. The *fifth* and *sixth* epithets, indeed, seem to imply that its scent is agreeable to the *Nacula;* and the *seventh* (according to the comment on the *Amaracósh*) that it is offensive to snakes. It is asserted by some, that the *Rásan* is no other than the Rough *Indian Achyranthes;* and by others, that it is one of the *Indian Aristólochias.* From respect to *Linnæus*, I leave this genus in his mixed class; but neither my eyes, nor far better eyes than mine, have been able to discover its *male* flowers; and it must be confessed, that all the descriptions of the *Ophyoxylum*, by

Rumphius, *Burman*, and the great botanist himself, abound with erroneous references, and unaccountable oversights.

71. *Pippala:*
Syn. Bódhi-druma, Chala-dala, Cunjarás'anas, An-wat'ha.
Vulg. Pippal.
Linn. Holy Ficus: but the three following are also thought *holy*. *Fruit* small, round, axillary, sessile, mostly twin. *Leaves* hearted, scalloped, glossy, daggered; *petiols* very long; whence it is called *Chaladala*, or the tree *with tremulous leaves*.

72. *Udumbara.*
Syn. Jantu-p'hala, Yajnyánga, Hémadugdhaca.
Vulg. Dumbar.
Linn. Racemed Ficus.
Fruit peduncled, top-shape, navelled, racemed.
Leaves egg-oblong, pointed, some hearted, obscurely sawed, veined, rough above, netted beneath. *Van Rheede* has changed the *Sanscrit* name into *Roembadoe*. It is true, as he says, that minute *ants* are hatched in the ripe fruit, whence it is named *Jantu-p'hala;* and the *Pandits* compare it to the *Mundane* Egg.

73. *Placsha:*
Syn. Jatí, Parcat'á.
Vulg. Pácari, Pácar.
Linn. Indian Ficus citron-leaved; but all four are *Indian*.
Fruit sessile, small, mostly twin, crowded, whitish.
Leaves oblong, hearted, pointed, with very long slender petiols.

74. *Vata:*
Syn. Nyagródha, Bahupat.

Vulg. Ber.
Linn. Bengal Ficus; but all are found in this province, and none peculiar to it.
Fruit roundish, blood-red, navelled, mostly twin, sessile. *Calyx* three-leaved, imbricated.
Leaves some hearted, mostly egged, obtuse, broadish, most entire, *petiols* thick, short, branches radicating.

The *Sanscrit* name is given also to the *very large Ficus India*, with radicating branches, and to some other varieties of that species. *Van Rheede* has by mistake transferred the name *Aswatt'ha* to the *Placsha*, which is never so called.

75. *Caraca:*
Syn. Bhauma, Ch'hatráca.
Vulg.
Linn. Fungus Agaric.

This and the *Phallus* are the only fungi which I have yet seen in *India:* the ancient *Hindus* held the fungus in such detestation, that *Yama*, a legislator, supposed now to be the judge of departed spirits, declares "those who eat mushrooms, whether spring-"ing from the ground or growing on a tree, fully "equal in guilt to the slayers of *Brahmins*, and the "most despicable of all deadly sinners."

76. *Tála:*
Syn. Trinrajan.
Vulg. Tal, Palmeira.
Linn. Borassus.

This magnificent palm is justly entitled the King of its order, which the *Hindus* call *trina druma*, or grass-trees. *Van Rheede* mentions the blush gelatinous, pellucid substance of the young *seeds*, which

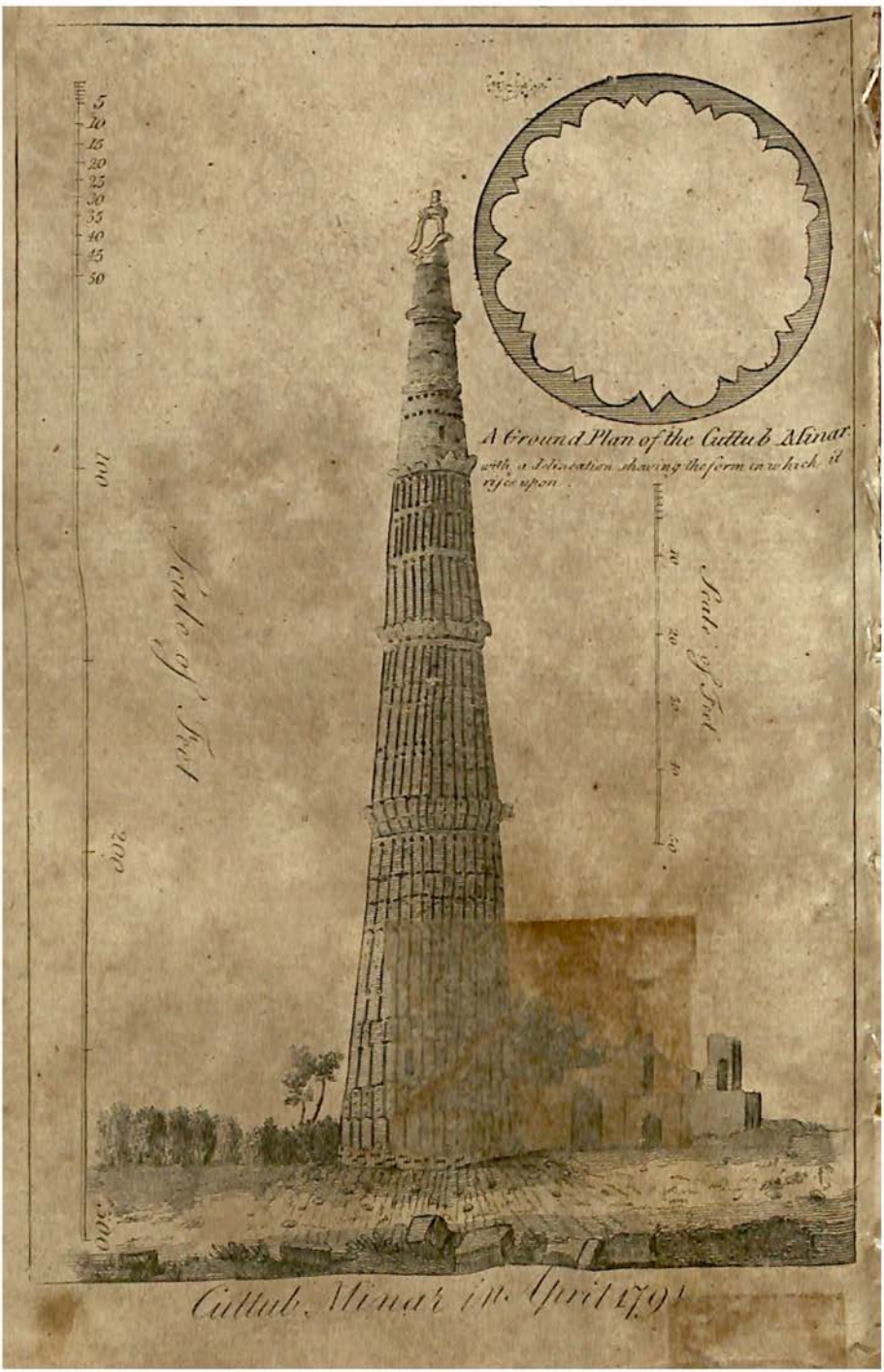
in the hot season is cooling, and agreeable to the taste; but the liquor extracted from the tree is the most seducing and pernicious of intoxicating vegetable juices: when just drawn, it is as pleasant as *Poubon* water fresh from the spring, and almost equal to the best mild *Champaigne*. From this liquor, according to *Rheede*, sugar is extracted; and it would be happy for these provinces, if it were always applied to so innocent a purpose.

77. *Nárícéla:*
Syn. Lángalin.
Vulg. Nárgil, Nárjìl.
Linn: Nut-bearing Cocos.

Of a palm so well known to *Europeans*, little more need be mentioned than the true *Asiatic* name: the water of the young fruit is neither so copious, nor so transparent and refreshing in *Bengal* as in the isle of *Hinzuan*, where the natives, who use the unripe nuts in their cookery, take extreme care of the trees.

78. *Guvá'ca:*
Syn. Ghónt'há, Púga, Cramuca, Capura.
Vulg. Supyá'ri.
Linn. Areca Catechu.

The trivial name of this beautiful palm having been occasioned by a gross error, it must necessarily be changed; and *Guvá'ca* should be substituted in its place. The inspissated juice of the *Mimosa C'hadira* being vulgarly known by the name of *Cat'h*, that vulgar name has been changed by *Europeans* into *Catechu*; and because it is chewed with thin slices of the *Udvéga*, or *Areca-nut*, a species of this palm has been distinguished by the same ridiculous corruption.


A Ground Plan of the Cuttub Minar
with a Delineation shewing the form in which it rises upon
Scale of Feet
Cuttub Minar in April 1791

A DESCRIPTION OF THE CUTTUB MINAR.

BY ENSIGN JAMES T. BLUNT,
OF THE ENGINEERS.

THE base of the *Cuttub Minar* is a polygon of twenty-seven sides, and rises upon it in a circular form; the diminution of the column is in a good proportion. I do not mean to infer, that the architect has followed any established rule, for it does not appear that the ancients, in any country, were tied down to rule; for although we see extremely different instances of the diminution in their works, in general they all look well.

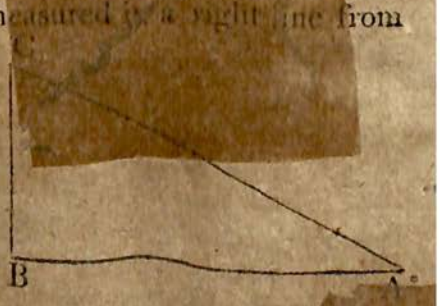
The exterior part of the *Minar* is fluted into twenty-seven semicircular and angular divisions, upon which is written a good deal of a very ancient *Arabic* character; it is supposed to contain passages from the *Koran;* there are four balconies in the height of the building, the first is at the height of 90 feet, the second at 120, the third at 180, and the fourth at 203 feet; to the height of 180 feet, the pillar is built of an exceeding fine red granite, and the fluting there ends. The balconies are supported upon large stone brackets, and have had small battlements erected upon them, as a preventive of people, who may choose to go into them, from falling; and serve likewise as an ornamental purpose to the build-

ing; from the height of 203 feet, excepting a few inconsiderable ornaments, it rises with an even surface, and circular form, built of very fine white marble; upon which the date when the *Minar* was completed is said to be written. It was a matter of much disappointment that I could not approach sufficiently near to the date to copy it; for I found it was situated at such a height, as to put it totally out of my power; and what adds to the difficulty is, that there is not a bamboo, or wood of any kind produced in that part of the country, calculated to raise a scaffolding with.

An irregular spiral stair-case leads from the bottom to the summit of the *Minar*, which is crowned with a majestic cupola of red granite; there are many openings during the ascent, for the admission of light and air; at each balcony, an opening to allow of people walking into them; but I found the battlements in many parts entirely ruined, and those that were standing, in such a decayed state as to render it a matter of some danger to venture out from the stair-case.

The entire height of the *Cuttub Minar* is 242 feet 6 inches: I ascertained it by measuring a direct line from its base; and, as it may be a matter of some satisfaction to see that it is done with precision, I annex the trigonometrical calculation.

The Base A B being measured in a right line from the bottom of the *Minar*, was found to be 402 feet 6 inches, twenty-four feet one inch, the semi-diameter of the base of the *Minar* being added to it,



gave a line of 426 feet 7 inches from the centre of the pillar. At the extremity of the base A, a theodolite was placed, and previously being carefully adjusted, by putting the line of collimation in the telescope, parallel to the plane of the horizon, the angle B A C was observed to be twenty-nine degrees, thirty-nine minutes; thence the height of the *Cuttub Minar*, was found to be 242 feet and nearly 6 inches.

By Plane Trigonometry.

The Base A B giving 426 feet, 7 inches, say 426, 5, the angle B A C is given 29°, 39′, the angle B A C is a right one; the sum of the angles in all triangles being equal to two right angles, or 180 degrees, by deducting the sum of the two angles C A B and A B C, from the sum of three angles in the triangle A B C, the angle A C B will be found.

C A B = 29. 39
A B C = 90. —

180—119. 39 = 60. 21 = angle A C B.

Then as the angle A C B is to the side A B, so is the angle C A B to the side C B, or height of the *Minar*,

Log. S. of ACB Log. of AB Log. S. of CAB Log. of CB
9,93905 : 62942 :: 9, 69434 : 242,5
+2, 62942

10, 32376
-9, 93905 feet

2, 38471 = 242,5
X 2

The *Cuttub Minar* is situated about nine miles bearing S. 16° W. from the *Jumma Musjid*, that was erected by the Emperor *Shaw Jehan* in the present city of *Delhi*, and appears to have been designed for a *Minaret* to a most stupendous mosque, which never was completed; a considerable part of the second and corresponding *Minaret* is to be seen, and many other parts of this intended immense building, particularly of the arches. The mosque seems to have been abandoned in this unfinished state, from causes at this time entirely unknown; perhaps the original designer of the fabric found human life too short to see it accomplished during his existence. It may not appear a matter of much surprise that the wealth of one man should be found inadequate to so arduous an undertaking, however opulent and exalted in life his situation may have been. The tomb of *Cuttub Shaw*, at whose expense the *Minar* is said to have been built, is to be seen a few hundred yards to the westward of it; the tomb is rather inconsiderable and of mean appearance, when compared with the many more magnificent mausoleums that are to be met with in the extensive ruins of *Delhi*.

Cuttub Shaw came to the throne of *Delhi* in the *Mussulman* year 602, corresponding with the *Christian* æra 1205, and died in the *Mussulman* year 607, or *Christian* æra 1210, a reign of only five years; and certainly a period not sufficient to erect so large a building as a mosque, to correspond in magnitude and grandeur with the *Minar* and other parts of the structure that were begun upon adjoining to it.

I think it may with some degree of reason be inferred that a stop was put to the building of the mosque at the decease of *Cuttub Shaw*, and from which period we may date the *Minar* to have been completed; conformably with this inference, it is

certained that the *Minar* has stood at least 580 years. Excepting the unavoidable and irresistible effects of lightning, from the goodness of the materials, and the excellent judgment with which they appear to have been put together, there is every reason to suppose it would have withstood the ravages of time, for succeeding generations to behold with admiration and astonishment, for yet many ages.

XIX.

ASTRONOMICAL OBSERVATIONS

MADE ON

A VOYAGE

TO THE

ANDAMAN AND NICOBAR ISLANDS.

BY LIEUT. R. H. COLEBROOKE.

Diamond Island, near Cape Negrais, 1789.

DECEMBER 14th. By the Sun's meridian altitude taken on shore - - - - - *Lat.* 15° 49′ 33″
By Captain *Kyd* - - - - - - - - 15 49 43

Mean 15 49 38

Carnicobar Island, 1790. *On board the Atalanta Sloop of War, about one mile from the western shore.*

January 2d, Sun's meridian altitude 57° 44′ 40″ *Lat.* 9° 8′ 52″.

BEARINGS.

Northernmost point of the land -	N. 16° E.
Southernmost point of do. - - -	S. 21 E.
Nearest shore - - - - - - - -	N. 70 E.

Danish Point, at Nancowry, 1790. *Observations for the Latitude, taken near the Flag-Staff.*

	Sun or Stars.	Doub. Mer. Alts.	Latitude N.
Jan. 11	Capella	104 33′ 0″	8° 1′ 51″
	Canopus	58 48 0	8 2 17
20	α Persei	97 54 30	8 2 31
21	Sun's lower limb	123 42 0	8 2 27
	Capella	104 34 30	8 2 36
	β Aurigæ	106 18 10	8 2 49
23	Capella	104 34 20	8 2 35
	β Aurigæ	106 17 30	8 2 29
		Mean of the whole	8 2 26, 8

If the first observation by Capella be rejected, the mean of the remaining seven will be 8° 2′ 32″.

The observations were made with a fine sextant by *Troughton*, and artificial horizon. The refractions applied in computing these, and all the following observations, were taken from Monsieur *Le Gentil's* table, published in his *Voyage dans les Mers de L'Inde*. The declinations of the stars were taken from table 7th of the requisite tables, and partly from *Dun's* catalogue.

Observations for Longitude, by the Eclipses of Jupiter's Satellites.

Apparent-time 1790.				Satell.	Weather.	Im. or Em.	Longit. in time.			Longit. in deg.		
d.	h.	′	″				h.	′	″	°	′	″
January 11	12	17	44	1	Clear.	Imm.	6	13	25	93	21	15
20	8	36	51	1	Do.	Imm.	6	13	27	93	21	45
23	11	5	12	2	Do.	Imm.	6	13	26	93	21	30
Mean Longitude of *Danish* Point, East from *Greenwich*										93	21	30

The Telescope was a refractor, magnifying from 80 to 90 times.

Pumbank Island, on board the Experiment Cutter. The Southern extremity of the Island bearing East.

February 10th, Sun's meridian altitude - - 67° 18′ 30″
Do. by Capt. *Kyd* - - - 67 18 0

Mean 67 18 15 *Latitude* 8° 13′ 1″

CARNICOBAR ISLAND.

February 15.

Sun's meridian altitude 68° 5′ 30″ *Lat.* 9° 5′ 31″.
The southernmost point of the island bore E. ½ S. 1 mile distant.

February 16.

Sun's meridian altitude 68° 26′ 15″
Do. by Capt. *Kyd* - 68 26 30

Mean 68 26 22 *Lat.* 9° 6′ 24″
Southernmost point of the island bore W ¼ S 1 ¼ mile distant.

Chatham Island in Port Cornwallis, at the Great Andaman*, 1790.

OBSERVATIONS FOR LATITUDE.

Date.	Names of Stars.	D. Alts. on Mer.	Latitude.
Feb. 23	Canopus	51 31 0	11 41 0
24	β Aurigæ	113 36 30	11 42 5
	α Ursæ Majoris	77 40 0	11 41 40
26	β Aurigæ	113 36 0	11 41 50
	ε Canis Majoris	99 15 0	11 41 23
	δ Canis Majoris	104 21 0	11 40 49
28	β Aurigæ	113 36 30	11 42 0
	Canopus	51 41 10	11 40 55
March 2	ε Canis Majoris	99 15 30	11 41 8
3	Sirius	123 46 30	11 40 50
9	π Argo Navis..	63 14 40	11 40 37
11	ξ Argo Navis..	77 48 30	11 41 40
	β Ursæ Majoris	88 25 30	11 42 5
			Mean 11 41 23, 9

* The Old Harbour so called.

Observations for Longitude, by the Eclipses of Jupiter's Satellites.

Apparent time 1790.			Satel.	Weather.	Im. or Em.	Longit. in time.	Longit. in deg.
	d.	h. ′ ″				h. ′ ″	d. ′ ″
Feb.	24	13 31 56,5	2	Clear,	Emer.	6 10 24, 5	92 36 7, 5
	26	14 45 59	1	Ditto,	Emer.	6 10 25	92 38 45
March	7	11 10 41,5	1	Ditto,	Emer.	6 10 34, 5	92 38 37, 5
	14	8 7 47,5	2	Ditto,	Emer.	6 10 33, 5	92 38 22, 5
	15	13 6 38,5	1	Ditto,	Emer.	6 10 19, 5	92 34 52, 5
	16	7 35 34	1	Ditto,	Emer.	6 10 10	92 32 30
						Mean	92 36 22, 5

An excellent chronometer, by *Arnold*, was used in observing the time; to correct which, frequent observations of the sun and stars were taken. The former, by equal or corresponding altitudes, observed before and after noon, to which the proper equations were applied: and in the latter case by taking several altitudes of a star east, and one west, a few minutes before and after the observation: these were calculated separately, and the mean of the results was applied to the correction of the watch. The apparent time, as deduced from the sun or stars, agreed in general within a second or two.

XX.

Astronomical Observations made on a Survey through the Carnatic and Mysore Country. By Lieutenant R. H. Colebrooke.

OBSERVATIONS FOR LATITUDE.

Date.	Names of Stars.	Mer. altitudes observed.	Lat. derived.	Mean latitude.	Bearing and distance of the nearest place.
1791.		d. ′ ″	d. ′ ″	d. ′ ″	
Feb. 2	Capella	57 19 15	13 4 48		
	Canopus	24 23 0	13 3 34		
3	β Aurigæ	58 10 0	13 3 52	13 3 57	Villout Choultry, W by N ½ N 1 mile dist.
	β Canis Majoris ..	59 5 0	13 3 38		
	Sirius	60 30 10	13 3 53		
15	Capella	57 27 0	13 12 33		
	Aurigæ	58 19 45	13 13 37	13 13 14, 6	Chitore Fort, N 65 W 1¼ mile dist.
	Sirius	60 20 30	13 13 34		
16	β Aurigæ	58 18 0	13 11 52		
	β Canis Majoris ..	58 56 0	13 11 38	13 12 19	Marsundrum Village, S by E 4 furl. dist.
	Sirius	60 21 37	13 12 27		
18	Capella	57 25 30	13 11 3		
	Canopus	24 14 50	13 11 46		
	β Aurigæ	58 18 20	13 12 12	13 11 38, 7	Moogly Pagoda, W 5 S 4 furl. dist.
	Sirius	60 22 30	13 11 34		

Date.	Names of Stars.	Mer. altitudes observed.	Lat. derived.	Mean latitude.	Bearing and distance of the nearest place.
1791.		d. ′ ″	d. ′ ″	d. ′ ″	
Feb. 20	Capella	57 26 45	13 12 19		
	Sirius	60 21 15	13 12 49		
21	β Aurigæ	58 19 30	13 13 22	13 12 51	Palmanaire, S 60 E 1 mile dist.
	Sirius	60 21 30	13 12 34		
	β Aurigæ	58 19 20	13 13 12		
March 2	β Aurigæ	58 11 0	13 4 52	13 4 35, 5	Oosscottah, N 72 W 1 mile 6 furl. dist.
	Sirius	60 29 45	13 4 19		
May 7	α Ursæ Majoris	39 36 30	12 27 59	— —	Santanoor, N by E 2 furl. dist.
13	α Ursæ Majoris	39 34 15	12 25 44	12 25 42, 5	Arakeeree Fort, SE 2 furl. dist.
	Do. by Lt. Bushby	39 34 12	12 25 41		
25	γ Ursæ Majoris	47 35 45	12 26 14	12 26 24, 6	Kanambaddy, W 1 mile dist.
	δ Ursæ Majoris	44 15 40	12 26 19		
	Σ Ursæ Majoris	45 22 0	12 26 41		
30	η Ursæ Majoris	52 11 50	12 32 47	12 32 43	Tondanoor Village, N N W 6 furl. dist.
	θ Centauri	42 8 30	12 32 39		
	ξ Ursæ Majoris	46 45 45	12 46 2		
June 11	η Ursæ Majoris	52 24 30	12 45 24	21 45 29	Yekaty Village, N 27 E 4 furl. dist.
	θ Centauri	41 56 10	12 45 1		
17	η Ursæ Majoris	52 25 15	12 46 9	12 46 8	Bimnelly Village, W ½ furl. dist.
	θ Centauri	41 55 0	12 46 7		
19	η Ursæ Majoris	52 27 15	12 48 9	12 47 58	Hoolior-droog, N 74 W 4 miles dist.
	θ Centauri	41 35 20	12 47 47		

Date.	Names of Stars.	Mer. altitudes observed.	Lat. derived.	Mean latitude.	Bearing and distance of the nearest place.
1791.		d. ′ ″	d. ′ ″	d. ′ ″	
June 29	Antares	51 6 0	12 57 31	12 57 20, 5	Maggry Pagoda, with the Bull, N 60 E 1 furlong dist.
	η Draconis	40 59 40	12 57 10		
July 21	τ Scorpii	40 27 30	12 37 23	12 37 42	Anchitty Droog, S 38 E 3 ¾ miles dist.
	γ Draconis	51 7 30	12 38 1		
25	Antares	51 29 0	12 34 30	— —	Neeldurgum, N 70 W 1 ¾ mile dist.
Sept. 29	δ Cygni	58 31 30	13 8 41	13 8 50, 3	Singauaikanapilly Village, SSE 2 f. d.
	α Cygni	58 36 45	13 8 47		
	γ Grus	38 32 30	13 8 27		
30	δ Cygni	58 31 35	13 8 46		
Oct. 1	α Cygni	58 36 45	13 8 47		
2	Fomalhaut	46 8 35	13 8 59		
3	Fomalhaut	46 8 30	13 9 4		
6	α Grus	28 54 50	13 9 12	12 57 39	In the Area of Bangalore Palace.
Nov. 26	Fomalhaut	46 20 0	12 57 36		
	α Cassiopeæ	47 34 30	12 57 20		
	Ditto by Capt. Kyd,	47 35 0	12 57 50		
	δ Cassiopeæ	43 50 0	12 57 53		
Dec. 16	Sun's Lower Limb	53 22 35	13 1 8	13 1 15, 5	Sandicoupang Fort, E ¼ furlong dist.
	α Cassiopeæ	47 38 30	13 1 21		
	θ Eridani	35 51 30	13 0 59		
	α Persei	53 55 45	13 1 31		

Date.	Names of Stars.	Mer. altitudes observed.	Lat. derived.	Mean latitude.	Bearing and distance of the nearest place.
1791.		d. ′ ″	d. ′ ″	d. ′ ″	
Dec. 27	δ Cassiopeæ	43 49 45	12 57 40	12 57 27	Maggry Pagoda, with the Bull, N 76 W 4 furlongs dist.
	θ Eridani	35 55 15	12 57 14		
	α Persei	53 52 7	12 57 57		
28	θ Eridani	35 55 20	12 57 9		
	α Persei	53 52 0	12 57 50		
31	Sun's Lower Limb..	53 40 15	12 57 19		
1792.					
Feb. 20	β Aurigæ	57 34 0	12 27 53	12 27 52, 2	Camp before Seringapatam, the Great Pagoda bearing from the place of observation S 2° W 2¾ miles distant—Latitude of Great Pagoda derived 12° 25′ 34″.
	β Canis Majoris ..	59 40 45	12 27 51		
	Sirius	61 6 15	12 27 43		
21	β Aurigæ	57 34 10	12 28 3		
	β Canis Majoris ..	59 41 10	12 27 26		
	Sirius	61 6 0	12 27 58		
29	β Aurigæ	57 34 10	12 28 3		
Mar. 3	Aurigæ	57 34 15	12 28 8		
	Sirius	61 6 25	12 27 33		
4	ξ Ursæ Majoris....	46 28 0	12 28 3		
	η Ursæ Majoris....	52 7 0	12 27 42		
15	ε Canis Majoris....	48 51 0	12 27 45		
	δ Canis Majoris....	51 28 0	12 28 11		
April 19	α Ursæ Majoris....	39 38 30	12 29 29	— —	Tripatore Fort, SE 1 mile dist.
28	α Ursæ Majoris....	40 3 20	12 54 30	12 54 32	Vellore Fort.
	δ Centauri.....	27 33 15	12 54 34		

Observations for Longitude by the Eclipses of Jupiter's Satellites.

Date and apparent time of the observations.	Sat.	Imm. or Emer.	Weather.	Longit. in time.	Longit. in degrees.	Bearing and distance of the nearest place.
1791. d. h. ′ ″				h. ′ ″	d. ′ ″	
Feb. 22 12 33 42	1	Imm.	Clear,	5 14 10	78 32 30	Palmanaire, S 60 E 1 mile dist.
Mar. 3 8 54 3	1	Imm.	Ditto,	5 10 28	77 37 0	Oosscottah, N 72 W 1¾ mile dist.
May 27 10 9 42	1	Emer.	Windy,	5 6 24	76 36 0	Seringapatam Great Pagoda, S 8° E 5 m. d.
Jnne 12 8 25 19, 5	1	Emer.	Clear,	5 6 52,5	76 43 7,5	Yekaty Village, N 27 E 4 furl. dist.
19 10 18 54	1	Emer.	Ditto,	5 7 17	76 49 15	Hoolior-droog, N 74 E 4 miles dist.
1792.						
Mar. 12 13 36 9	1	Imm.	Ditto,	5 6 12	76 33 0	Camp before Seringapatam Pagoda, bearing S 2 W 2¼ miles dist.
19 15 32 3	1	Imm.	Ditto,	5 6 8	76 32 0	
21 10 0 54	1	Imm.	Ditto,	5 5 57	76 29 15	

Magnifying power of the Telescope 80 to 100 Achromatic.

XXI.

Table of Latitudes and Longitudes of some principal Places in India, determined from Astronomical Observations.—By Mr. Reuben Burrow. Communicated by Lieut. R. H. Colebrooke.

Places.	Latitude N.	Longit. in time.	Remarks.
	d. ′ ″	h. ′ ″	
Russapugly, near Calcutta	22 30 20	5 53 30	Mr. Burrow's Residence.
Bygonbarry	24 48 14	6 0 46	The old Factory on the Barrampooter River.
Dewangunge	25 9 31	5 58 36	
Tealcopee	25 19 16	5 58 34	
Shealdoo Nullah	25 58 8	5 59 17	At the Conflux with the River.
Bakkamarchor	26 1 44	5 59 43	
Kazycottah	26 9 4	6 0 33	
Goalparra	26 11 21	6 2 9	The Kotie, or Factory.
Doobarey	26 1 6	5 59 42	The Mount.
Dadnachorr	25 3 36		The large Tree.
Pookereah	24 54 6	5 59 45	
Sagow	24 35 41		Between two large trees, centre of the town.
Tingarchorr	24 18 6	6 2 15	Near the mouth of the Bannar River.
Diggamabad	24 0 38		
Ameerabad	23 55 31	6 3 7	Mouth of the Nullah.
Sampmarray	23 40 16	6 2 30	
Remateally Nullah	22 55 35	6 2 54	Conflux with the Megna River.
Rajegunge	22 38 7	6 0 38	End of the Town near Sootaloory.
Coweally	22 37 30	5 59 55	
Gonganagor	22 37 30	5 59 47	

At Cheduba, and on the Arracan Coast.

Places.	Latitude.	Longitude.	Spot of Observation and Remarks.
	d. ′ ″	h. ′ ″	
Tree Island	18 27 30	6 16 12	
Cheduba Flag Staff	18 53 8	6 14 28	
House Island	18 56 42	6 14 19	Centre Rock.
Maykawoody	18 50 43	6 15 11	Fort of Cheduba.
Jy	19 5 46	6 15 11	Fort of Tumbiah.
Dumsil	18 57 40	6 16 7	An Island in the Cantabida, or Catabida River.
Jykuna Island	18 44 40	6 15 43	North end of the Island.
Chagoo Rock	18 48 51		Near the Mouth of the Catabida River.
Kyaunimo	18 54 36	6 16 0	A Town in the Catabida Harbour.
Cedars Point	18 52 58	6 15 21	A remarkable Point in Cheduba.

On the Ganges, &c.

Nuddea	23 25 49	5 53 32	Junction of the Hoogly and Cassimbazar Rivers.
Sackey Fort	23 40 0		
Gour	24 53 0	5 52 13	The ancient Round Tower.
Rajemahl	25 3 15	5 50 56	The Marble Palace.
Colgong	25 16 6	5 48 39	Mr. Cleveland's Bungalow.
Mongheer	25 22 57	5 45 57	Rocky point of the Fort.
Patna	25 36 3	5 41 2	Chehelsetoon, or Alaverdi's Palace near the Fort.
Bankipoor	25 37 38	5 40 40	Granary.
Buxar	25 34 27	5 35 59	Fort Flag Staff.
Mouth of the Caramnassa River	25 30 20	5 35 31	

Places.	Latitude.	Longitude.	Spot of Observation and Remarks.
	d. ′ ″	h. ′ ″	
Mouth of the Goomty	25 31 25	5 32 36	
Oojear	25 35 21		
Benares	25 18 36	5 31 59	The Hindoo Observatory.
Chunar Fort	25 7 40	5 31 22	Flag Staff.
Chunar Camp	25 6 30	5 31 12	Captain Bough's Bungalow.
Tonse River	25 16 16	5 28 0	Conflux with the Ganges.
Allahabad	25 25 56	5 27 24	SE corner of the Fort at Preyag.
Correahcottah	25 33 16	5 26 28	Close to the Nullah, highest part of the Town.
Surajepoor	26 10 24	5 21 58	River side, near the Middle of the Town.
Jaujesmow	26 26 25	5 21 15	Seebsmot on the Hill.
Caunpour	26 30 3	5 20 54	Magazine Gaut.
Joognagpoor	26 44 46	5 20 15	At the Gaut.
Nanamow	26 53 0	5 20 0	At the old Stone Gaut.
Mindi Gaut	27 0 33	5 19 30	
Canouge	27 3 30	5 19 12	The Fort.
Cussumkhore	27 8 56	5 19 5	Seebsmot on the Hill.
Keasspore	27 13 25		
Sungrumpore	27 14 28	5 18 8	The Gaut.
Futtyghur	27 23 11	5 18 5	The Fort.
Jillalabad	27 43 56	5 18 56	The Fort.
Berimutana	27 52 22	5 18 20	The Well.
Kheerpoor	27 58 22	5 18 16	Near the Old Fort.
Cutterah	28 1 47	5 18 12	The Brick Fort.

Y 2

Places.	Latitude.			Longitude.			Spot of Observation and Remarks.
	d.	′	″	h.	′	″	
Jessocah	28	8	17	5	17	53	Well.
Fereedpour	28	12	54	5	17	41	The Fort.
Bareilly	28	22	5	5	17	5	The Fort.
Lumberah	28	27	39				
Hafizgunge	28	29	40	5	17	53	The Serai.
Nabobgunge	28	32	29	5	18	11	
Lillowry	28	36	38				
Pillibeat	28	37	42	5	18	46	The Edgaw.
Ditto, Hafiz Musjid	28	38	20	5	18	47	Centre of Pillibeat.
Gowneerah	28	37	35				
Barrower	28	36	53	5	17	55	NE end of the Town on the Banks of the Bhagul.
Shair Ghur	28	38	50	5	17	1	Fort.
Bourkah	28	43	23	5	16	26	
Rampour	28	48	50	5	15	34	NW Gate of the City.
Moradabad	28	50	24	5	14	44	Centre of Rustum Khan's Palace.
Mahmudpore	28	42	1	5	14	12	
Sumbul	28	35	14	5	13	49	The ancient Fort Gate of Kollankee Ootar.
Boojepoor	28	56	39	5	14	55	Seebs Temple in the Tope.
Bhyrah	29	2	11	5	15	6	
Cossipore	29	12	44	5	15	24	Fort.
Hazaretnagor	29	12	5	5	14	53	Fort.
Rair	29	21	13	5	14	33	Hindoo Moat, through the Town.
Afzul Ghur	29	23	45	5	14	14	Palace in the Fort.

Places.	Latitude.	Longitude.	Spot of Observation and Remarks.
	d. ′ ″	h. ′ ″	
Sheercote	29 19 48		Principal Mosque in the City.
Nundenah	29 27 16	5 13 19	Brick Fort.
Nidjibabad	29 36 46	5 12 52	White Mosque.
Patter Ghur	29 36 31	5 12 59	High Gate of the Fort.
Chundnywalla	29 52 8		
Asoph Ghur	29 44 14	5 12 19	Centre of the Fort.
Borunwalla	29 47 26		This Village is in the large Jungle.
Lolldong	29 50 28		Place where the Camp was in 1774.
Joogywalla	29 58 0	5 12 16	Bamboo Fort.
Chandy Gaut	29 56 24	5 12 10	Stone Temple, opposite Hurdwar.
Hurdwar	29 57 9	5 12 9	Northernmost Building in the Town.
Congree	29 53 19		Also called Hyder Ghur.
Nagal	29 39 40	5 12 16	The Nawab's Artillery Shed.
Mundawer	29 29 5	5 12 2	Dowlet Khan's Musjid.
Darahnagur	29 16 49	5 12 0	Nidjib Khan's Seray.
Chaundpour	29 13 4	5 12 12	
Amrooah	28 54 22	5 13 27	Fort of the Sieds.
Khunspour	28 44 29		
Hussenpour	28 43 8	5 12 39	Stone Gate of the Fort.
Seersee	28 28 52	5 12 37	Well of the Town.
Anopshir	28 22 50	5 12 36	On the Steep Bank, East of the Flag Staff.
Donaree	28 21 10		Mud Fort.
Chandousey	28 26 51	5 14 45	East Gate of the Town.

Places.	Latitude.			Longitude.			Spot of Observation and Remarks.
	d.	′	″	h.	′	″	
Bissoolie	28	18	51	5	15	17	Doondy Khan's Musjid.
Bunneah	28	12	29				Village in a Jungle.
Budawun	28	2	39	5	16	0	Large ancient Mosque of Cuttub ud Dien.
Ossoheet	27	48	12	5	16	28	East Gate.
Bettoor	26	37	24	5	20	40	Gow Ghaut.
Gopalpour	26	3	49				
Mobarickpour	25	31	18				
Bogwangolah	24	20	45	5	22	50	Mouth of the Culcullia * River.
Tea Cally Dumduma	24	1	26	5	55	40	
Pubna	24	0	12	5	56	27	The Hindoo Temple.
Cossunda	23	53	48	5	59	3	
Dacca	23	43	0	6	1	12	The Chief's House, called the Pooshta.

* The entrance of the Culcullee, or Culcullia River is no longer at Bogwangolah, but about twelve miles lower down, between Murcha and Cutlamary; which change may have been produced by the encroachment of the Ganges.

Note by Mr. Barrow.

As a more particular account will be given hereafter of the manner in which these Latitudes and Longitudes were deduced, it will be sufficient here to mention, that the Meridian Altitudes of Stars from whence the Latitudes were derived, sometimes amounted to twenty or thirty, North and South, and very seldom were less than five or six, and those mostly on both sides the Meridian; so that, upon the whole, I believe very few of the foregoing Latitudes can be more than five seconds wrong, perhaps not many of them so much, as the single observations with the Sextant seldom differed from one another more than fifteen or twenty seconds, and very often not half the number. As to the Longitudes, it is possible there may in some cases be an error of two or three miles; but I can scarce believe there is any great probability of it, as the observations were made, as well as calculated, in a different and more exact manner than is generally used at present.

XXII.

ON SOME EXTRAORDINARY FACTS, CUSTOMS, AND PRACTICES OF

THE HINDUS.

BY THE PRESIDENT.

IN the preliminary discourse addressed to the Society by our late President, *Man* and *Nature* were proposed as the comprehensive objects of our Researches; and although I by no means think that advantage should be taken of this extensive proposition to record every trivial peculiarity of practice, habit, or thinking, which characterizes the natives of *India*, many singularities will be found amongst them which are equally calculated to gratify curiosity, and to attract the notice of the philosopher and politician.

Of all studies, that of the human mind is of the greatest importance; and whether we trace it in its perfection or debasement, we learn to avoid error, or obtain models for improvement, and examples for imitation. In pursuing customs and habits to the principles from which they are derived, we ascertain by the sure rule of experience the effects of natural or moral causes upon the human mind.

The characters of the natives of *India*, notwithstanding all that has been published in *Europe*, are by no means well understood there; and a careful and accurate investigation of them, with a due discrimi-

nation of habits and usages, as local or general, would afford a subject for a curious, useful, and entertaining dissertation.

It is not my intention to undertake it. I neither profess to have ability, nor have I leisure for the task; and the preceding remarks are offered to the Society for the purpose only of introducing the recital of some extraordinary facts, customs, and practices of this country, which have occurred to my observation in the course of public duty. If the narrative has too much of the language of office, it may be deemed a sufficient compensation that it is extracted from official documents and judicial records, and hence has a claim to authenticity.

The inviolability of a *Bráhmin* is a fixed principle of the *Hindus;* and to deprive him of life, either by direct violence, or by causing his death in any mode, is a crime which admits of no expiation. To this principle may be traced the practice called *Dherna*, which was formerly familiar at *Benares*, and may be translated *Caption* or *Arrest*. It is used by the *Bráhmins* in that city, to gain a point which cannot be accomplished by any other means; and the process is as follows:

The *Bráhmin* who adopts this expedient for the purpose mentioned, proceeds to the door or house of the person against whom it is directed, or wherever he may most conveniently intercept him; he then sets down in *Dherna*, with poison or a poignard, or some other instrument of suicide in his hand, and threatening to use it if his adversary should attempt to molest or pass him, he thus completely arrests him. In this situation the *Bráhmin* fasts; and by the rigor of the etiquette, which is rarely infringed, the unfortunate object of his arrest ought also to fast; and thus they both remain until the institutor of the

Dherna obtains satisfaction. In this, as he seldom makes the attempt without resolution to persevere, he rarely fails; for if the party thus arrested were to suffer the *Bráhmin* sitting in *Dherna* to perish by hunger, the sin would for ever lie upon his head. This practice has been less frequent of late years, since the institution of the Court of Justice at *Benares* in 1783; but the interference of that Court, and even that of the Resident there, has occasionally proved insufficient to check it; as it has been deemed in general most prudent to avoid for this purpose the use of coercion, from an apprehension that the first appearance of it might drive the sitter in *Dherna* to suicide. The discredit of the act would not only fall upon the officers of justice, but upon the government itself.

The practice of sitting in *Dherna* is not confined to male *Bráhmins* only. The following instance, which happened at *Benares* in the year 1789, will at once prove and exemplify it:

Beenoo Bhai, the widow of a man of the *Bráhminical* tribe, had a litigation with her brother-in-law *Balkishen*, which was tried by arbitration; and the trial and sentence were revised by the court of justice at *Benares*, and again in appeal.

The suit of *Beenoo* involved a claim of property and a consideration of cast, which her antagonist declared she had forfeited. The decision was favourable to her, but not to the extent of her wishes; and she resolved therefore to procure by the expedient of the *Dherna*, as above explained, what neither the award of arbitration nor the judicial decision had granted.

In conformity to this resolution, *Beenoo* sat down in *Dherna* on *Balkishen*; and he, after a perseverance

of several days, apprehensive of her death, repaired with her to a *Hindu* temple in *Benares*: where they both continued to fast some time longer. Thirteen days had elapsed from the commencement of *Balkishen's* arrest, when he yielded the contest, by entering into a conditional agreement with *Beenoo*, that if she could establish the validity of her cast, and in proof thereof prevail on some creditable members of her own tribe to partake with her of an entertainment of her providing, he would not only defray the expense of it, but would also discharge her debts. The conditions were accepted by *Beenoo*, who fulfilled her part of the obligation; and her antagonist, without hesitation, defrayed the charges of the entertainment: but the non-performance of his engagement to discharge her debts, induced *Beenoo Bhai* to institute a suit against him; and the practice of the *Dherna*, with the proofs of it, were thus brought forward to official notice.

It is not unworthy of remark, that some of the *Pandits*, on being consulted, admitted the validity of an obligation extorted by *Dherna*, provided the object were to obtain a just cause or right, wickedly withheld by the other party, but not otherwise. Others again rejected the validity of an engagement so extorted, unless it should be subsequently confirmed by the writer, either in whole or in part, after the removal of the coercion upon him.

Of the practice which I have related, no instance exactly similar has occurred to my knowledge in *Bengal* or *Behar*, although *Bráhmins*, even in *Calcutta*, have been known to obtain charity or subsistence from *Hindus*, by posting themselves before the doors of their houses, under a declaration to remain there until their solicitations were granted. The moderation of the demand generally induces a compliance with it;

which would be withheld if the requisition were excessive. But I have been credibly informed that instances of this custom occasionally occur in some parts of the *Vizier's* dominions, and that *Bráhmins* have been successfully employed there to recover claims, by calling upon the debtor to pay them, with a notification that they would fast until the discharge of the debt. The debtor, if he possesses property or credit, never fails to satisfy the demand against him.

Another practice, of a very singular and cruel nature, is called Erecting a *Koor*. This term is explained to mean a circular pile of wood which is prepared ready for conflagration. Upon this, sometimes a cow, and sometimes an old woman, is placed by the constructors of the pile; and the whole is consumed together. The object of this practice is to intimidate the officers of government, or others, from importunate demands, as the effect of the sacrifice is supposed to involve, in great sin, the person whose conduct forces the constructor of the *Koor* to this expedient.

An instance of this practice occurred in a district of the province of *Benares* in the year 1788. Three *Bráhmins* had erected a *Koor*, upon which an old woman had suffered herself to be placed; the object of temporary intimidation was fully attained by it, and the timely interposition of authority prevented the completion of the sacrifice. It cannot be uninteresting to know the cause which urged the three *Bráhmins* to this desperate and cruel resource. Their own explanation is summarily this: That they held lands in partnership with others, but that the public assessment was unequally imposed upon them; as their partners paid less, whilst they were charged with more than their due proportion; they therefore refused to discharge any part of the revenues whatever, and erected a *Koor* to intimidate the government's officers from

making any demands upon them. Their sole object, as they explicitly declared, was to obtain an equal distribution of the public assessment between themselves and their partners.

A woman, nearly blind from age, had in this instance been placed upon the *Koor:* she was summoned to appear before the English superintendent of the province, but absolutely refused to attend him; declaring that she would throw herself into the first well rather than submit. The summons was not enforced.

This is the only instance of setting up a *Koor* which had occurred for many years, previous to 1788, although the practice is said to have been frequent formerly. No information has reached me of the repetition of this practice in *Benares*, or of the existence of it in any other part of the Company's possessions; nor is it pretended that it was ever general throughout *Benares*, but is expressly asserted to have been limited to a very small portion of that extensive province.

This last-mentioned fact is very opposite to that humanity and mildness of disposition by which the author of the historical disquisition, regarding ancient and modern *India*, affirms the inhabitants of this country to have been distinguished in every age. As a general position, liable to particular exceptions, I am not authorised to dispute it: but it must at the same time be admitted, that individuals in *India* are often irritated by petty provocations to the commission of acts which no provocation can justify; and, without reference to the conduct of professed depredators, examples may be produced of enormities scarcely credible: the result of vindictive pride, and ungoverned violence of temper.

In support of these assertions, I shall quote three remarkable instances, attested by unquestionable evidence. In 1791 *Soodishter Mier*, a *Bráhmin*, the farmer of land paying revenue, and tenant of tax-free land in the province of *Benares*, was summoned to appear before a native officer, the duty collector of the district where he resided. He positively refused to obey the summons, which was repeated without effect; and after some time several people were deputed to enforce the process, by compelling his attendance. On their approaching his house he cut off the head of his deceased son's widow, and threw it out. His first intention was to destroy his own wife; but it was proved in evidence that, upon his indication of it, his son's widow requested him to decapitate her; which he instantly did.

In this case, the process against *Soodishter* was regular, his disobedience contemptuous; his situation in life entitled him to no particular exemption, he had nothing to apprehend from obeying the requisition, and he was certain of redress if injury or injustice were practised upon him.

Another *Bráhmin*, named *Baloo Paunden*, in 1793, was convicted of the murder of his daughter. His own account of the transaction will best explain it, and his motives: I give it in abstract. That about twelve years before the period of the murder, he, *Baloo*, and another man, were joint tenants and cultivators of a spot of ground, when this partner of *Baloo* relinquished his share. In 1793 this partner again brought forward a claim to a share in the ground: the claim was referred to arbitration, and a decision was pronounced in favour of *Baloo*. He consequently repaired to the land, and was ploughing it, when he was interrupted by his opponent. The words of *Baloo* are as follows: "I became angry, and en-

" raged at his forbidding me; and bringing my own " little daughter *Apmunya*, who was only a year and " a half old, to the said field, I killed her with my " sword." This transaction also happened in the province of *Benares*.

The last instance is an act of matricide, perpetrated by *Beechuk* and *Adher*, two *Bráhmins*, and zemindars, or proprietors of landed estates, the extent of which did not exceed eight acres; the village in which they resided was the property of many other zemindárs. A dispute, which originated in a competition for the general superintendence of the revenues of the village, had long subsisted between the two brothers and a person named *Gowry;* and the officer of government, who had conferred this charge upon the latter, was intimidated into a revocation of it by the threats of the mother of *Beechuk* and *Adher* to swallow poison, as well as to the transfer of the management to the two *Bráhmins*. By the same means of intimidation he was deterred from investigating the complaints of *Gowry*, which had been referred to his enquiry by his superior authority.

But the immediate cause which instigated the *Bráhmins* to murder their mother, was an act of violence, said to have been committed by the emissaries of *Gowry*, with or without his authority, and employed by him for a different purpose, in entering their house, during their absence at night, and carrying off forty rupees, the property of *Beechuk* and *Adher*, from the apartments of their women.

Beechuk first returned to his house, where his mother, his wife, and his sister-in-law, related what had happened. He immediately conducted his mother to an adjacent rivulet, where, being joined in the

grey of the morning by his brother *Adher*, they called out aloud to the people of the village, that although they would overlook the assault as an act which could not be remedied, the forty rupees must be returned. To this exclamation no answer was received; nor is there any certainty that it was even heard by any person; and *Beechuk*, without further hesitation, drew his scymitar, and at one stroke severed his mother's head from her body, with the professed view, as entertained and avowed both by parent and son, that the mother's spirit, excited by the beating of a large drum during forty days, might for ever haunt, torment, and pursue to death *Gowry* and the others concerned with him. The last words which the mother pronounced were, that she would blast the said *Gowry* and those connected with him.

The violence asserted to have been committed by the emissaries of *Gowry* in forcibly entering the female apartments of *Beechuk* and *Adher*, might be deemed an indignity of high provocation; but they appear to have considered this outrage as of less importance than the loss of their money, which might and would have been recovered with due satisfaction, by application to the Court of Justice in *Benares*. The act which they perpetrated had no other sanction than what was derived from the local prejudices of the place where they resided: it was a crime against their religion: and the two brothers themselves quoted an instance of a *Bráhmin* who, six or seven years before, had lost his cast and all intercourse with the other *Bráhmins*, for an act of the same nature. But in truth *Beechuk* and *Adher*, although *Bráhmins*, had no knowledge or education suitable to the high distinction of their cast, of which they preserved the pride only; being as grossly ignorant and prejudiced as the meanest peasants in any part of the world. They seemed surprised when they heard the doom of

forfeiture of cast pronounced against them by a learned *Pandit*, and openly avowed that, so far from conceiving they had committed a barbarous crime, both they and their mother considered their act as a vindication of their honour, not liable to any religious penalty.

The Society will observe, with some surprise, that the perpetrators of the several acts which I have related were *Bráhmins*. These facts took place within three districts only of the province of *Benares*, named *Kuntel*, *Buddhooee*, and *Kereat Sekur*. I mention these particulars that I may not lead any person into a common error of deducing general conclusions from partial circumstances. In *Bengal* and *Behar*, where the passions of jealousy, pride, and revenge, sometimes produce very fatal consequences, I recollect no instance where the efforts of their violence have been transferred from the objects which excited it to others that were innocent, as in the preceding cases.

That the practice of Infanticide should ever be so general as to become a custom with any sect or race of people, requires the most unexceptionable evidence to gain belief: and I am sorry to say that the general practice, as far as regards female infants, is fully substantiated with respect to a particular tribe on the frontiers of *Juanpore*: a district of the province of *Benares*, adjoining to the country of *Oude*. A race of *Hindus* called *Rajekoomars* reside here; and it was discovered in 1789 only, that the custom of putting to death their female offspring, by causing the mothers to starve them, had long subsisted, and did actually then very generally prevail among them. The resident at *Benares*, in a circuit which he made through the country where the *Rajekoomars* dwell, had an opportunity of authenticating the exist-

ence of the custom from their own confessions: he conversed with several: all unequivocally admitted it, but all did not fully acknowledge its atrocity; and the only reason which they assigned for the inhuman practice, was the great expense of procuring suitable matches for their daughters, if they allowed them to grow up. It is some satisfaction to add, that the custom, though general, was not universal, as natural affection, or some other motive, had induced the fathers of some *Rajekoomar* families to bring up one, or more, of their female issue; but the instances where more than one daughter had been spared, were very rare. One village only furnished a complete exception to the general custom; and the *Rajekoomar* informant, who noticed it, supposed that the inhabitants had sworn, or solemnly pledged themselves to each other, to bring up their females. In proof of his assertion in favour of the village in question, he added, that several old maids of the *Rajekoomar* tribe then actually existed there, and that their celibacy proceeded from the difficulty of procuring husbands for them, in consequence of the great expenses attending the marriages of this class of people.

It will naturally occur to the Society to ask, by what mode a race of men could be continued under the existence of the horrid custom which I have described. To this my documents enable me to reply, partly from the exceptions to the general custom, which were occasionally admitted by the more wealthy *Rajekoomars;* more particularly those who happened to have no male issue; but chiefly by intermarriages with other *Rajepoot* families, to which the *Rajekoomars* were compelled by necessity.

A *prohibition* enforced by the denunciation of the severest temporal penalties, would have little efficacy in abolishing a custom, which existed in op-

position to the feelings of humanity and natural affection; and the sanction of that religion which the *Rajekoomars* professed was appealed to, in aid of the ordinances of civil authority. Upon this principle an engagement, binding themselves to desist in future from the barbarous practice of causing the death of their female children, was prepared and circulated amongst the *Rajekoomars* for their signature; and as it was also discovered that the same custom prevailed, though in a less degree, amongst a smaller tribe of people also within the province of *Benares*, called *Rajebunses*, measures were adopted at the same time, to make them sensible of its iniquity, and to procure from them a subscription similar to that exacted from the *Rajekoomars*.

The following is a copy of the engagement which the latter subscribed:—

"*Whereas* it hath become known to the Government of the Honourable East India Company, "that we, of the tribe of *Rajekoomars*, do not suffer "our female children to live; and whereas there is "a great crime, as mentioned in the *Brehma Byvant* "*Pooran*, where it is said that killing even a *Fœtus* "is as criminal as killing a *Brâhmin*; and that for "killing a female, or woman, the punishment is to "suffer in the *nerk*, or hell, called *Kat Shootul*, for "as many years as there are hairs on their female's "body, and that afterwards that person shall be born "again, and successively become a leper, and be "afflicted with the *Jukhima*; and whereas the British "Government in *India*, whose subjects we are, have "an utter detestation of such murderous practices, "and we do ourselves acknowledge, that although "customary among us, they are highly sinful, we "do therefore hereby agree not to commit any longer "such detestable acts: and any among us (which God "forbid) who shall be hereafter guilty thereof, or

" shall not bring up and get our daughters married,
" to the best of our abilities, among those of our cast,
" shall be expelled from our tribe, and shall neither
" eat nor keep society with us, besides suffering
" hereafter the punishments denounced in the above
" *Pooran* and *Shaster*. We have therefore entered
" into this agreement.

" *Dated the 17th December*, 1789."

A *record* of the various superstitious ceremonies which prevail throughout *Hindostan*, would form a large and curious volume; but as all the preceding instances which I have related, are taken from transactions in *Benares*, I cannot refrain from mentioning the superstitious notions of the people of that province regarding the sugar-cane: which proves an ignorance that may be admitted in palliation of grosser errors. The narrative is a mere extract from an official record, with an omission of some words, and some trifling verbal alterations.

As it is usual with the ryots, or husbandmen, to reserve a certain portion of the canes of the preceding year to serve as plants for their new cultivation, it very frequently happens that inconsiderable portions of the old cane remain unappropriated. Whenever this happens, the proprietor repairs to the spot on the 25th of *Jeyte*, or about the 11th of *June*, and having sacrificed to *Nagbele*, or the tutelary deity of the cane, he immediately sets fire to the whole, and is exceedingly careful to have this operation executed in as complete and efficacious a manner as possible.

This act is performed from an apprehension, that if the old canes were allowed to remain in the ground beyond the 25th of *Jeyte*, they would in all probability produce flowers and seeds; and the appearance of these flowers they consider as one of the greatest misfortunes that can befal them.

They unanimously assert, that if the proprietor of a plantation ever happens to view even a single cane therein in flower after the 25th of *Jeyte*, the greatest calamities will befal himself, his parents, his children, and his property: in short, that death will sweep away most of the members, or indeed the whole of his family, within a short period after this unfortunate spectacle. If the proprietor's servant happens to see the flower, and immediately pulls it from the stalk, buries it in the earth, and never reveals the circumstance to his master; in this case they believe that it will not be productive of any evil consequence. But should the matter reach the proprietor's knowledge, the calamities before stated must, according to the prevailing ideas, infallibly happen.

In support of this belief, many of the most aged zemindars and ryots in the province of *Benares*, recited several instances of the above nature, which they affirmed to have actually happened during their own time; and moreover, that they had been personal witnesses to the evils and misfortunes which befel the unhappy victims of the description alluded to.

When we reflect how generally credit was given to the power of witchcraft, long after the revival of letters in *Europe*, and that names of great repute for learning and abilities are found amongst its defenders, we shall not be surprised that charms and amulets are wore in this country by men of superior rank and education; that astrologers are consulted to name the fortunate hour for commencing a journey or expedition; and that the fascinating influence of an evil eye upon the human constitution, as well as the power of witchcraft, is admitted by the vulgar in general. Fortunately, however, the practice is not supposed to bear any proportion to the belief of the power; although two recent instances occur to my

recollection, of individuals having been sacrificed to this popular delusion; or at least the imputation of witchcraft was made the pretence for depriving them of life.

"But the judicial records contain a case of great enormity, in which five women were put to death for the supposed practice of sorcery. I shall submit the circumstances of this transaction, with some detail, before the Society, premising that it happened in a district of *Ramgur*, the least civilized part of the Company's possessions, amongst a wild and unlettered tribe, denominated *Soontaar*, who have reduced the detection and trial of persons suspected of witchcraft to a system.

Three men of the cast of *Soontaar*, were in the year 1792 indicted for the murder of five women; the prisoners without hesitation confessed the crime with which they were charged, and pleaded in their defence that with their tribes it was the immemorial custom and practice to try persons notorious for witchcraft. That for this purpose an assembly was convened of those of the same tribe, from far and near; and if after due investigation the charge was proved, the sorcerers were put to death, and no complaint was ever preferred on this account to the ruling power. That the women who were killed had undergone the prescribed form of trial, were duly convicted of causing the death of the son of one of the prisoners by witchcraft, and had been put to death by the prisoners, in conformity to the sentence of the assembly.

The prosecutors, who, agreeably to the forms of the *Mohammedan* law, were the relations of the deceased women, declared they had no charge to prefer against the prisoners, being satisfied that their relations had really practised sorcery.

The custom pleaded by the prisoners was fully substantiated by the testimony of a great number of witnesses, who recited specific facts in support of it without any denial or disagreement; and from the collective evidence exhibited in the course of the inquiry, the following curious and extraordinary circumstances appeared:—

That the successive demise of three or four young people in a village, led to a suspicion of sorcery as the cause of it; and the inhabitants taking alarm, were upon the watch to detect the witches. They were generally discovered dancing naked at midnight by the light of a lamp, with a broom tied round their waists, either near the house of a sick person, or on the outside of the village.

To ascertain with a greater degree of certainty the persons guilty of practising witchcraft, the three following modes are adopted:

First. Branches of the *Saul* tree, marked with the names of all the females in the village, whether married or unmarried, who have attained the age of twelve years, are planted in the water in the morning, for the space of four hours and a half; and the withering of any of these branches is proof of witchcraft against the person whose name is annexed to it.

Secondly. Small portions of rice enveloped in cloths, marked as above, are placed in a nest of white ants; the consumption of the rice in any of the bags, establishes sorcery against the woman whose name it bears.

Thirdly. Lamps are lighted at night; water is placed in cups made of leaves, and mustard-seed and oil is poured, drop by drop, into the water, whilst the name of each woman in the village is pronounced; the appearance of the shadow of any woman on the water, during this ceremony, proves her a witch.

Such are the general rules for ascertaining those who practise witchcraft. In the instance which I have quoted, the witnesses swore, and probably believed, that all the proofs against the unfortunate women had been duly verified: they assert in evidence, that the branches marked with the names of the five women accused were withered; that the rice in the bags having their specific names, was devoured by the white ants, whilst that in the other bags remained untouched; that their shadows appeared on the water, on the oil being poured upon it whilst their names were pronounced; and farther, that they were seen dancing at midnight in the situation above described.

It is difficult to conceive that this coincidence of proof could have been made plausible to the grossest ignorance, if experience did not shew that prepossession will supersede the evidence of the senses.

The following custom would be too trivial for notice, if it were not strongly descriptive of the simplicity and ignorance which mark the character of the generality of the inhabitants of *Ramgur*.

From habitual neglect in ascertaining the quantities of land held in lease, and in defining with accuracy their respective tenures, frequent disputes arise between the inhabitants of different villages regarding their boundaries: to determine them, a reference is usually made to one or more of the oldest inhabitants of the adjacent villages; and if these should not agree in their decision, other men are selected from the inhabitants of the villages claiming the disputed ground; and the trial proceeds as follows: Holes are dug in the contested spot, and into these holes each of the chosen men puts a leg, and the earth is then thrown in upon it; and in this situation they remain until

one either expresses a wish to be released, or complains of being bitten or stung by some insect. This decides the contest, and the property of the ground is adjudged to belong to that village the inhabitant of which goes through the trial with the most fortitude and escapes unhurt by insects.

If the preceding detail has no relation to [illegible] it is at least descriptive of manners; and in availing myself of the opportunities afforded by official occupations (which is all indeed that these occupations admit) to contribute my portion to the researches of the Society, my example will, I hope, be imitated by those who, with the same, or greater opportunities, possess more knowledge, ability, and leisure.

NOTE.

Having lately received some further documents on the subject of the *Dhurna*, which I did not possess when the preceding paper was read to the Society, I have extracted from them what appears to me requisite to elucidate this extraordinary practice. From these documents it appears that several cases of *Dhurna* had been brought before the Provincial Court of Justice at *Benares;* and as a penalty had been annexed to the performance of this mode of importunity, it became necessary to define with precision the rules constituting *Dhurna*, according to the *Shaster* and *Usage.*

For this purpose a question was proposed to several *Pandits*, inhabitants of the province and city of *Benares;* and the answer subscribed by twenty-three *Pandits* is as follows:

" Any one who sits *Dhurna* on another's door, or in his house, for the realization of a debt, or for other purpose, in which the party sitting takes with him some weapon or poison, and sits down; nor does he eat himself, nor allow the party against whom he is sitting, or his family to eat; nor does he allow any person ingress into that person's house, nor egress from it; and addressing himself in terms of the strongest oaths to the people of the house, he says, " If any " of those of your house shall eat victuals, or go into " your house, or go out of it, I shall either wound " myself with this weapon, or swallow this poison;" and it does sometimes happen that both these events take place, and that he who sits in *Dhurna* is not to remove from it without the intreaty of those on whom he is sitting, or the order of the *Hakim*. Whenever all the requisites above-mentioned are found united, they constitute *Dhurna;* but if any one of them be wanting, that is not *Dhurna*, but *Tuckaza* or *Dunning;* and as no text of the *Shaster* hath been found concerning *Dhurna*, wherefore we have delivered the requisites thereof according to the common custom and practice."

There is some difference in the opinions of other *Pandits* as to what is understood to constitute *Dhurna;* but the quotation which I have inserted, appears to me to contain the most authentic information on this subject.

The Society will observe that the practice is not specifically pointed out in the *Shaster*, but has the sanction of usage only.

The following instance is of late occurrence. In *January*, 1794, *Mohun Panreh*, an inhabitant of a district in the province of *Benares*, sat down in *Dhurna*

before the house of some *Rajepoots*, for the purpose of obtaining the payment of *Birt*, or a charitable subsistence to which he had a claim; and in this situation destroyed himself by swallowing poison. Some of the relations of the deceased retained his corpse for two days before the house of the *Rajepoots*; who thus were compelled to forego taking sustenance, in order to induce them to settle the *Birt* on the heir of the deceased *Brâhmin*.

XXIII.

DESCRIPTION OF THE YAK OF TARTARY,

CALLED

SOORA-GOY,

OR

THE BUSHY-TAILED BULL OF TIBET.

BY LIEUTENANT SAMUEL TURNER.

THE *Yak* of *Tartary*, called *Soora-Goy* in *Hindostan*, and which I term the bushy-tailed bull of *Tibet*, is about the height of an *English* bull, which he resembles in the figure of the body, head, and legs. I could discover between them no essential difference, except only that the *Yak* is covered all over with a thick coat of long hair. The head is rather short, crowned with two smooth round horns, that, tapering from the setting-on, terminate in sharp points, arch inwardly, and near the extremities are a little turned back; the ears are small; the forehead appears prominent, being adorned with much curling hair; the eyes are full and large; the nose smooth and convex; the nostrils small; the neck short, describing a curvature nearly equal to both above and below; the withers high and arched; the rump low. Over the shoulders rises a bunch, which at first sight would seem to be the same kind of exuberance peculiar to the cattle of *Hindostan*; but in reality it consists in the superior length of the hair only, which, as well as that along the ridge of the back to the setting-on of the

tail, grows long and erect, but not harsh. The tail is composed of a prodigious quantity of long flowing glossy hair descending to the hock, and is so extremely well furnished, that not a joint of it is perceptible; but it has much the appearance of a large bunch of hair artificially set on. The shoulders, rump, and upper part of the body is clothed with a sort of thick soft wool, but the inferior parts with straight pendant hair, that descends below the knee; and I have seen it so long in some cattle which were in high health and condition, as to trail upon the ground. From the chest, between the fore-legs, issues a large pointed tuft of hair, growing somewhat longer than the rest. The legs are very short. In every other respect, hoofs, &c. he resembles the ordinary bull. There is a great variety of colours amongst them, but black or white are the most prevalent. It is not uncommon to see the long hair upon the ridge of the back, the tail, tuft upon the chest, and the legs below the knee white, when all the rest of the animal is jet black.

These cattle, though not large boned, from the profuse quantity of hair with which they are provided, appear of great bulk. They have a down heavy look, but are fierce, and discover much impatience at the near approach of strangers. They do not low loud (like the cattle of *England)* any more than those of *Hindostan;* but make a low grunting noise scarcely audible, and that but seldom, when under some impression of uneasiness. These cattle are pastured in the coldest parts of *Tibet*, upon the short herbage peculiar to the tops of mountains and bleak plains. That chain of lofty mountains situated between lat. 27 and 8, which divide *Tibet* from *Bootan*, and whose summits are most commonly clothed with snow, is their favourite haunt. In this vicinity the southern glens afford them food and shelter during the severity of winter; in milder seasons the northern aspect is more

congenial to their nature, and admits a wider range. They are a very valuable property to the tribes of illiterate *Tartars*, who live in tents and tend them from place to place, affording their herdsmen a mode of conveyance, a good covering, and subsistence. They are never employed in agriculture, but are extremely useful as beasts of burthen; for they are strong, sure footed, and carry a great weight. Tents and ropes are manufactured of their hair; and I have, though amongst the humblest rank of herdsmen, seen caps and jackets worn of their skin. Their tails are esteemed throughout the *East*, as far as luxury or parade have any influence on the manners of the people; and on the continent of *India* are found, under the denomination of *Chowries*, in the hands of the meanest grooms as well as occasionally in those of the first ministers of state. Yet the best requital with which the care of their keepers is at length rewarded for selecting them good pastures, is in the abundant quantity of rich milk they give, yielding most excellent butter, which they have a custom of depositing in skins or bladders, and excluding the air: it keeps in this cold climate during all the year; so that after some time tending their flocks, when a sufficient stock is accumulated, it remains only to load their cattle and drive them to a proper market with their own produce, which constitutes, to the utmost verge of *Tartary*, a most material article of merchandise.

XXIV.

A DESCRIPTION OF THE JONESIA.

BY DOCTOR ROXBURGH.

Cl. Heptandria Monogynia.

ESSENTIAL CHARACTER.

CALYX, two-leaved, Corol, one-petaled, Pistil-bearing; base of the tube impervious; stamens long, ascending, inserted into the margin of a glandulous nectarial ring, which crowns the mouth of the tube, the uppermost two of which more distant. Style declining. Legume turgid.

Consecrated to the remembrance of our late President, the most justly celebrated Sir *William Jones*, whose great knowledge of this science, independent of his other incomparable qualifications, justly entitles his memory to this mark of regard.

Jonesia Aśóca.

Asjogam. Hort. Mat. 5, P. 117, Tab. 59.
Aśóca is the *Sanscrit* name.
Vanjula, a synonyme.
Russuk of the *Bengalese*.

Found in gardens about *Calcutta*, where it grows to be a very handsome middling sized ramous tree; flowering time the beginning of the hot season; seeds ripen during the rains. The plants and seeds were,

I am informed, originally brought from the interior parts of the country, where it is indigenous.

Trunk erect, though not very straight. Bark dark brown, pretty smooth. Branches numerous, spreading in every direction, so as to form a most elegant shady head.

Leaves alternate, abruptly feathered, sessile, generally more than a foot long; when young, pendulous and coloured.

Leaflets opposite, from four to six pair, the lowermost broad lanced, the upper lanced; smooth, shining, firm, a little waved, from four to eight inches long.

Petiole common, round and smooth.

Stipule axillary, solitary; in fact a process from the base of the common petiole, as in many of the grasses and monandrists, &c.

Umbels terminal and axillary; between the stipule and branchlet, globular, crowded, subsessile, erect.

Bracts, a small hearted one under each division of the umbel.

Peduncle and pedicels smooth, coloured.

Flowers very numerous, pretty large; when they first expand, they are of a beautiful orange-colour, gradually changing to red, forming a variety of lovely shades; fragrant during the night.

Calix perianth, below two-leaved, leaflets small, nearly opposite, coloured, hearted, bracte-like, marking the termination of the pedicel, or beginning of the tube of the corol.

Corol one-petaled, funnel-form; tube slightly incurved, firm and fleshy, tapering towards the base (club-funnel-shaped) and there impervious; border four-parted; division spreading, suborbicular; margins most slightly woolly: one-third the length of the tube.

Nectary, a stameniferous and pistiliferous ring crowns the mouth of the tube.

Stamens, filaments (generally) seven, and seven must, I think, be the natural number, viz. three on each side, and one below, above a vacancy, as if the place of an eighth filament, and is occupied on its inside by the pistil; they are equal, distinct, ascending, from three to four times longer than the border of the corol.

Anthers uniform, small, incumbent.

Pistil, germ oblong, pediceled; pedicel inserted into the inside of the nectary, immediately below the vacant space already mentioned; style nearly as long as the stamens, declining; stigma simple.

Pericarp, legume scimitar-form, turgid, outside reticulated, otherwise pretty smooth, from six to ten inches long, and about two broad.

Seeds generally from four to eight, smooth; grey, size of a large chesnut.

Note. Many of the flowers have only the rudiment of a pistil: a section of one of these is at D.

REFERENCES.

A. A branchlet natural size.

B. A single flower a little magnified, *aa* the calyx.

C. A section of the same, exhibiting four of the stamens 1. 1. 1. 1. the pistil 2, and how far the tube is perforated.

D. A similar section of one of the abortive flowers; 3 is the abortive pistil.

E. The ripe legume opening near the base, natural size. Note, the space between the *b* and *c* marks the original tube of the corol.

F. One of the seeds natural size.

G. The base of the common petiole, with its stipules; *aa* the petioles of the lower pair of leaflets.

XXV.

Astronomical Observations, by William Hunter, Esq.

LATITUDES OBSERVED.

1793.	Places.	Sun or Star.	Latitude.	Remarks.
			d. ′ ″	
Sept. 27	Khodahgunge, Camp on the South Bank of the Caly-Muddee: Gate N. 58 W 4,1 furl.	⊙ M. A.	27 10 00	Clear. Moderate.
				By Survey, difference of Latitude between Futtehgurh and Khodahgunge is 11′ 1″, Khodahgunge and Jelalabad 4′ 54″. Making Futtehgurh 27° 22′ 8″, these give Khodahgunge 27° 11′ 7″, and Jelalabad 27° 6′ 13″. As the last agrees so very exactly with the observation, I think the Latitude observed at Khodahgunge was too little.
28	Jelalabad, Gate N 52 W 1,4 furl.	Ditto,	27 6 9	Clear. Moderate.
29	Meerin-ca-Seray, M 43 W 2,7 furl.	Ditto,	27 1 17	Do. Calm.
30	Poorooah, opposite Nanamow; which bears S 73 W 12 f.	Ditto,	25 53 42	Do. Moderate.
Oct. 2	Hasan-Gunge, Gate N 62 W 1 furl.	Ditto,	26 46 18	Do. Do.
5	Lucknow, Mr. Taylor's House	Ditto,	26 51 11	Do. Do.

1793.	Places.	Sun or Star.	Latitude.	Remarks.	
			d. ′ ″		
Oct. 17	Lucknow, Mr. Taylor's House	⊙ M. A.	26 52 1	Clear.	Moderate.
Dec. 12	Futtehgurh, my Bungalah	Do.	27 22 23	Do.	Do.
22	Jelalabad (Station of Sept. 28)	Do.	27 5 59	Do.	Do.
23	Meerin-ca-Seray (Do. of 29)	Do.	27 1 19	Do.	Do.
25	Tekeah, N 85 W 0,8 furl.	Do.	26 50 59	Do.	Windy.
1794.					
Jan. 16	Sirt'hirra, WNW 2 furl.	Do.	26 53 57	Do.	Moderate.
17	Sufdergunge, S 40 W 1 furl.	Do.	26 55 11	Do.	Windy.
18	Derriabad, S 64 W 1,5 furl.	Do.	26 53 37	Do.	Do.
	Ditto	⊙ 2 Alts.	26 53 31	Do.	Do.
19	Shujah-Gunge: N 28 W—S 72 W nearest distance (South end) 0,8 furl.	⊙ M. A.	26 49 35	Do.	Do.
20	Noray, NE—S 55 W nearest 30 yards	Do.	26 46 45	Do.	Do.
21	Surya-koond, Temple of the Sun, N 47 W 2, 16 furl.	Do.	26 45 6	Do.	Do.
22	Begum-Gunge, N 48 W—S 27 W nearest distance 50 yards	Do.	26 39 39	Do.	Moderate.
23	Tandah, Bungalahs	Do.	26 33 18	Do.	Do.
25	Ditto	Do.	26 33 29	Do.	Do.
26	Birriar-Gunge, Gate S 70 E 1,4 furl.	Do.	26 38 40	Do.	Do.
27	Jelal-ud-deen-nagur, S 66 E 1,8 furl.	Do.	26 43 5	Do.	Do.
28	Oudh, Tomb of Burla, N 56 W 1,8 furl.	Do.	26 48 43	Do.	Do.
29	Ditto	Do.	26 48 42	Do.	Do.

1794.	Places.	Sun or Star.	Latitude.	Remarks.
			d. ′ ″	
Jan. 30	Fyzabad; Octagon Tower at Rumnah....	⊙ M. A.	26 48 32	Clear. Windy.
31	Ditto	Do.	26 48 17	Do. Moderate
				Sun had passed the Meridian about three Minutes. Observation close.
Feb. 1	Noray, N 42 E—S 68 E 1 furl.	Do.	26 46 50	Thin flitting clouds; calm.
2	Shujah-Gunge, Gate S 48 E 4,9 furl.	Do.	26 50 3	Clear. Moderate.
3	Derriabad, Gate S 80 E 1,3 furl.	Do.	26 54 15	Do. Windy.
4	Sufdergunge (Station of Jan. 17)	Do.	26 55 45	Do. Do.
Mar. 30	Bewar	β U. M.	27 13 41	Do. Moderate.
31	Meinpoory, Mohcumgunge, S 31—73 W 2;75 furl.	α Hydræ	27 14 30	Do. Do.
April 1	Ditto	β U. M.	27 13 21	Do. Windy.
2	Boongaung	α Hydræ	27 15 30	Do. Moderate.
3	Mahommedabad	Do.	27 18 8	Do. Do.
May 29	Dawah, Mr. Becher's Bungalah	α ♍	26 51 6	Do. Do.
30	Ditto	Do.	26 51 6	Do. Do.
	Ditto	α Draconis	26 50 47	Do. Do.
31	Poorah, N 63 W 4 furl.	α ♍	26 44 5	Do. Do.
June 1	Chobepoor	α ♍	26 36 41	Do. Do.
2	Kanhpoor, Mr. Yeld's Bungalah	α ♌	26 28 37	Do. Do.
5	Ditto	α ♍	26 27 56	Do. Windy.
12	Oonam, SW 3 furl.	Do.	26 33 26	Do. Moderate.
13	Jelooter, Fort N 53 W 7,7 furl.	Do.	26 41 57	Do. Windy.

1794.	Places.	Sun or Star.	Latitude.	Remarks.	
			h. ′ ″		
June 14	Noel-Gunge, Gate S 20 W 2 furl.	α ♍	26 47 42	Clear.	Moderate.
Sept. 4	Meah-Gunge (near Jelooter) West Gate No. 1,75 furl.	α Pisc. Aust.	26 38 4	Do.	Calm.
11	Kahnpoor, Mr. Yeld's Bungalah	Do.	26 28 33	Do.	Do.
15	Ditto	Do.	26 28 56	Do.	Moderate.
16	Rampoor, near Muswasee	Do.	26 30 49	Do.	Do.
Oct. 17	Esewun S 70 E 4,1 furl.	☉ M. A.	26 48 50	Do.	Do.
18	Aterdhinee, N 42 W 6 furl.	Do.	26 50 48	Do.	Do.
19	Sultangunge, S 30 W—S 60 E 1,9 furl. ..	Do.	26 58 46	Do.	Light Breeze.
20	Purerah, south-east angle S 30 W 4,4 f. ..	Do.	27 7 16	Do.	Calm.
21	Lishkircepoor, S—S 34 E 1,2 furl.	Do.	27 1 39	Do.	Moderate.
22	Meerin ca-seray, SE 1 furl.	Do.	27 1 59	Do.	Do.
23	Sumjum, north end of Gunge	Do.	27 8 27	Do.	Do.

XXVI.

A DISSERTATION ON SEMIRAMIS.

THE ORIGIN OF MECCA, &c.

FROM THE HINDU SACRED BOOKS.

BY LIEUT. FRANCIS WILFORD.

IN the *Scánda-purána* and *Vis'va-sára pracása*, or *declaration of what is most excellent in the world*, we find the following legends, which have an evident relation to the origin of *Semiramis*, the *Syrian* dove, *Ninus*, and the building of *Nineveh*, *Hierapolis*, and *Mecca*, &c.

Mahá-déva and his consort *Párvati*, with a view to do good to mankind, quitted their divine abode on *Cailasa*, and proceeded towards the north, alighted on the summit of the *Nisháda* mountains, where they found the *Devátas* ready to receive them, with a numerous retinue of Celestial Nymphs, and Heavenly Choristers. *Mahá-déva* was so struck with the beauty of some of the *Apsaras*, and his looks were so expressive of his internal raptures, that *Párvati*, unable to conceal her indignation, uttered the most virulent reproaches against him. Conscious of the impropriety of his behaviour, *Mahá-déva* used every endeavour to pacify her; he humbled himself; he praised her, and addressed her by the flattering appellation of *Mahábhága*; but to no purpose. She fled into *Cusha-duíp*, on the mountains of *Vahni-vyápta*, and seating herself in the hollow trunk of a *Samì*-tree, performed

Tapasyá (or austere devotion) for the space of nine years; when fire springing from her, pervaded with rapid violence the whole range of mountains, insomuch, that men and animals were terrified, and fled with the utmost precipitation. *Dévi*, unwilling that her devotion should prove a cause of distress to the animal creation, recalled the sacred flame, and confined it in the *Samì* tree. She made the hollow of that tree her place of abode and dalliance; and hence she is called *Samì-Rámá*, or she who dallies in the *Samì*-tree.

The fugitives returning, performed the *Pujà* in adoration of her, with songs in her praise. The flame confined in the *Samì*-tree still remains in it; and the *Devatás* are highly delighted with the fire, which is lighted from the *Aranì* (or cubic wood of that tree). The *Aranì* is the mother of fire, and is produced from the *Samì*-tree. From that time, this sacred tree gives an increase of virtue, and bestows wealth and corn. In the month of *Aświna*, or *Cooar*, the tenth of the first fifteen days of the moon is kept holy, and *Pujá* is made to *Sami Rámá* and to the *Samì*-tree; and those who perform it obtain the object of their desires. This sacred rite I have hitherto kept concealed from the world, says *Mahádéva*, but now I make it known for the good of mankind; and whosoever performs it will be victorious over his enemies for the space of one year.

During these transactions, *Visvéswará-Mahá-déva*, or *Cási-pati* (that is to say, *Mahá-déva*, the lord of the world and sovereign of *Casi* or *Benares*) visited the country of *Purushotama*, in *Utcola-désa* or *Orissa*; which he was surprised to find overspread with long grass, and without inhabitants. He resolved to destroy the long grass, and for this purpose, assuming the diminutive shape of a dove, with an angry contenance,

commenced the performance *Tapasyà;* his consort *Dèví* also transformed herself into a bird of the same species; and from that time they were known to mankind, and worshipped under the titles of *Capóteswara* and *Capótési* or *Iswara* and *Isí*, in the shape of a dove. They set fire to the *Cusha*, or long grass, and the country became like *Vindra-van* near *(Muttra)* and was soon filled with inhabitants. The spot where they performed their *Tapasyà* is called to this day *Capóta-st'hali*, or the place of the dove. It is a celebrated place of worship, and, as I am informed, about five coss from *Jagannàt'ha.*

Almost the whole universe was likewise at this time overspread with long grass; and to destroy it, *Mahá-déva*, with his consort, resolved to travel round the world. They accordingly proceeded into *Cusha-duíp*, which they found thinly inhabited by a few *Mlech'has*, or impure tribes, and the *Yavanas*, who concealed their booty in the grass which covered the country.

Mahá-déva took compassion on them, and considering their sufferings in this inhospitable country as a sort of *Tapasyá*, he resolved to bestow *Mócsha*, or eternal bliss, on them: for this purpose he assumed the character and countenance of *Mócshéswara* or *Iswara*, who bestows *Mócsha;* and directed his consort *Capótési*, who is also called *Mahá-bhága*, to go to *Vahni-st'han*, on the borders of *Cusha-duípa;* there to make *Tapasyá*, in order to destroy the long grass. Accordingly she went into *Vahni-st'han;* and that she might effect it without trouble to herself, she assumed another form: from which circumstance she was named *Anáyásá.* In this character she seated herself on a beautiful hill, and there made *Tapasyá* for many days. At last fire sprung from her devotion; and its presiding power standing before her, she directed him

to destroy the *Cusha*; when the hills were soon in a blaze, and the *Yavanas* and other *Mléch'has* obtaining *Mócsha*, were reunited to the Supreme Being, without labour or effect on their part; that is to say, they were involved in the general conflagration, and destroyed.

When the grass was consumed, *Anáyása* ordered the clouds to gather and pour their waters on the land, which was soon overflowed. The waters then retired, and the four great tribes came into *Ousha-duíp*, where they soon formed a powerful nation, and became rich and happy. After the conflagration, all sorts of metals and precious stones were found throughout the country. The countenance of *Anáyásá-dévi* is that of fire; and a most divine form it is.

The inhabitants soon after deviating from the paths of rectitude, became like the *Mléch'has:* and the *Yavanas* re-entered *Cusha-duíp*, plundering and laying waste the whole country. The four tribes applied to *Anáyása*, offered praises to her, and requested she would protect them against the *Yavanas*, and dwell among them. *Maháb'hágá* assented; and the spot which she chose for her abode, is called *Mahá-bhágá-st'hán*, or the place of *Maháb'hágá*.

In the mean time *Mahá-déva* was at *Mócsha-st'hán*, or *Mócshésa*, bestowing *Mócsha* on all who came to worship there. It is a most holy place; and there *Mahá-déva* laid aside the countenance and shape of *Capotéswara*, and assumed that of *Mocshéwara*.

Among the first votaries of *Mahá-déva*, who repaired to *Mócsha-st'hán*, was *Víraséna*, the son of *Guhyaca*. He had been making *Tapasyà* for a long time, in honour of *Mahá-déva*, who at last appeared to him, and made him king over *St'haváras*, or

the immoveable part of the creation. Hence he was called, *St'hávar-pati;* and the hills, trees, and plants, and grasses of every kind were ordered to obey him. His native country was near the sea; and he began his reign with repressing the wicked, and insisting on all his subjects walking in the paths of justice and rectitude. In order to make his sovereign acknowledged throughout the world, he put himself at the head of a numerous army: and directing his course towards the north, he arrived at *Mócsha-st'hán,* where he performed the *Pujà* in honour of *Mócshéswara,* according to the rites prescribed in the sacred books. From *Mócshesa* he advanced towards the *Agni párvatas,* or fire-mountains, in *Vahnist'hán;* but they refused to meet him with presents, and to pay tribute to him. Incensed at their insolence, *St'hávar-pati* resolved to destroy them: the officers on the part of *Samí-Rámá,* the sovereign of *Vahnist'hán,* assembled all their troops, and met the army of *St'havar-pati;* but after a bloody conflict, they were put to flight.

Samí-Rámá amazed, inquired who this new conqueror was; and soon reflected that he could never have prevailed against her without a boon from *Mahá-déva,* obtained by the means of what is called *Ugra-Tapasyá,* or a *Tapasyá* performed with fervor, earnestness of desire, and anger. She had a conference with *St'hávar-pati;* and as he was, through his *Tapasyá,* become a son of *Mahá-déva,* she told him she considered him in that light, and would allow him to command over all the hills, trees, and plants in *Vahni-st'hán.* The hills then humbled themselves before *St'hávar-pati,* and paid tribute to him.

The origin of *Ninus* is thus related in the same sacred books. One day, as *Mahá-deva* was rambling over the earth naked, and with a large club in his hand, he chanced to pass near the spot where several

Munis were performing their devotions. *Mahá-déva* laughed at them, insulted them in the most provoking and indecent terms; and, lest his expressions should not be forcible enough, he accompanied the whole with significant signs and gestures. The offended *Munis* cursed him; and the *Linga* or *Phallus* fell to the ground. *Mahá-déva*, in this state of mutilation, travelled over the world, bewailing his misfortune. His consort too, hearing of this accident, gave herself up to grief, and ran after him in a state of distraction, repeating mournful songs. This is what the *Greek* mythologists called the Wanderings of *Dematar*, and the Lamentations of *Bacchus*.

The world being thus deprived of its vivifying principle, generation and vegetation were at a stand: gods and men were alarmed; but having discovered the cause of it, they all went in search of the sacred *Linga;* and at last found it grown to an immense size, and endowed with life and motion.

Having worshipped the sacred pledge, they cut it, with hatchets, into one-and-thirty pieces, which, *Polypus*-like, soon became perfect *Lingas*. The *Devatas* left one-and-twenty of them on earth; carried nine into Heaven, and removed one into the inferior regions, for the benefit of the inhabitants of the three worlds. One of these *Lingas* was erected on the banks of the *Cumud-vati*, or *Euphrates*, under the name of *Báléswara-Linga*, or the *Linga* of *Iswara the Infant*, who seems to answer to the *Jupiter Puer* of the western mythologists. To satisfy *Dévi*, and restore all things to their former situation, *Mahá-déva* was born again in the character of *Báléswara*, or *Iswara the Infant*. *Báléswara*, who fosters and preserves all, though a child, was of uncommon strength; he had a beautiful countenance; his manners were most engaging; and his only wish was to please every

body; in which he succeeded effectually; but his subjects waited with impatience till he came to the age of maturity, that he might bless them with an heir to his virtues. *Báléswara*, to please them, threw off his childlike appearance, and suddenly became a man, under the title of *Líléswara*, or *Iswara*, who gives pleasure and delight. He then began to reign over gods and men, with the strictest adherence to justice and equity: his subjects were happy; and the women beheld with extacy his noble and manly appearance. With the view of doing good to mankind, he put himself at the head of a powerful army, and conquered many distant countries, destroying the wicked, and all oppressors. He had the happiness of his subjects and of mankind in general so much at heart, that he entirely neglected every other pursuit. His indifference for the female sex alarmed his subjects: he endeavoured to please them; but his embraces were fruitless. This is termed *Asc'halanst'hán*. The *Apsaras*, or celestial nymphs, tried in vain the effect of their charms. At last *Sami-Rámá* came to *Asc'halanst'hán*, and retiring into a solitary place in its vicinity, chanted her own metamorphoses and those of *Líléswara*, who happening to pass by, was so delighted with the sweetness of her voice, that he went to her and inquired who she was. She related to him how they went together into *Utcoladésa* in the characters of the *Capóteswara* and *Capotési:* adding, you appeared then as *Moeshéswara*, and I became *Anayasa;* you are now *Líléswara*, and I am *Sàmì-Ràmà*, but I shall be soon *Líléswarì*. *Líléswara*, being under the influence of *Máya*, or worldly illusion, did not recollect any of these transactions; but suspecting that the person he was speaking to might be a manifestation of *Parvati*, he thought it adviseable to marry her; and having obtained her consent, he seized her hand, and led her to the performance of the nuptial ceremony, to the universal satisfaction of his subjects.

Gods and men met to solemnize this happy union; and the celestial nymphs and heavenly quiristers graced it with their presence. Thus *Sami-Rámá* and *Líléswara* commenced their reign, to the general satisfaction of mankind, who were happy under their virtuous administration.

From that period the three worlds began to know and worship *Líléswara*, who, after he had conquered the universe, returned into *Cusha-dwípa*. *Líléswara* having married *Sami-Rámá*, lived constantly with her, and followed her wherever she chose to go: in whatever pursuits and pastimes she delighted, in these alone he took pleasure; thus they travelled over hills and through forests to distant countries; but at last returned to *Cusha-dwíp:* and *Sami-Rámá* seeing a delightful grove near the *Hradancità* (or deep water) with a small river of the same name, expressed a wish that he would fix the place of their residence in this beautiful spot, there to spend their days in pleasure.

This place became famous afterwards, under the name of *Lila-st'hán*, or the place of delight. The water of the *Hradancità* is very limpid, and abounds with *Camala*-flowers, or *red Lotos*.

Sami-Rámá is obviously the *Semiramis* of the western mythologists, whose appellation is derived from the *Sanscrit Sami-Rámési*, or *Isí (Isis)* dallying in the *Sami*, or Fir-tree. The title of *Sami-Rámési* is not to be found in the *Puránás;* but it is more grammatical than the other; and it is absolutely necessary to suppose the word *Isí*, or *Esi* in composition, in order to make it intelligible.

*Diodorus Siculus** informs us that she was born

* *Diodorus Siculus*, lib. 3. cap. 2.

at *Ascalon*: the *Puránás* say, that her first appearance in *Syria* was at *Asch'alana-st'hán*, or the place where *Lilésia* or *Ninus* had *Asc'halana*.

The defeat of *Semiramis* by *Staurobates*, is recorded in the *Puránás* with still more extravagant circumstances; for *Staurobates* is obviously *St'hávara-pati*, or *St'hávara-pati*, as it is more generally pronounced.

The places of worship mentioned in the above legends are *Mócshésá* or *Mócha-st'hán*, *Asc'hala-st'hán* or *Asc'halana-st'hán*, two places of the name of *Lila-sth'án* or *Lilésa-st'hán*. *Mnáyásá-dévi-st'hán* and *Mahá-bhágá st'hán*.

The *Bráhmins* in the western parts of *India*, insist that *Mócsha st'hán* is the present town of *Mecca*. The word *Mócsha* is always pronounced in the vulgar dialects, either *Moca* or *Mucta*; and the author of the *Dabistan* says, its ancient name was *Maca*. We find it called *Maco Raba*, by *Ptolemy*, or *Moca the Great* or *Illustrious*. *Guy Patin* mentions a medal of *Antoninus Pius* with this legend, "MOK. IEP. AXY. ATTO." which he very properly translates, *Moca, sacra, inviolabilis, suis utens legibus*, "*Moca the holy, the inviolable, and using her own laws.*" This, in my humble opinion, is applicable only to *Mecca*, or *Mócsha-st'hán*, which the *Puránás* describe as a most holy place. The *Arabian* authors unanimously confirm the truth of the above legend; and it is ridiculous to apply it to an obscure and insignificant place in *Arabia Petrea*, called also *Moca*. It may be objected, that it does not appear that *Mecca* was ever a *Roman* colony. I do not believe it ever was; but at the same time it was possible that some connection for commercial purposes might have existed between the rulers of *Mecca* and the *Romans* in *Egypt*. The learned are not ignorant

that the *Romans* boasted a little too much of their progress in *Arabia*; and even medals were struck with no other view, apparently, but to impose on the multitude at *Rome*. It is unfortunate that we do not meet in the *Puránás* with the necessary *data* to ascertain, beyond doubt, the situation of *Moeshea*. From the particulars contained in them, however, it appears to have been situated a great way to the westward, with respect to *India*, and not from *Egypt* and *Ethiopia*, as has been shewn in a former dissertation on these countries, and in the third volume of the *Asiatic Researches*.

It is declared in the *Puránás* that *Capótéswara* and his consort *Capótési*, in the shape of two doves, remained there for some time; and *Arabian* authors inform us, that in the time of *Mohammed*, there was in the temple of *Mecca* a *pigeon* carved in wood, and another above this: to destroy which, *Mohammed* lifted *Ali* upon his shoulders. These pigeons were most probably placed there in commemoration of the arrival of *Mahá-déva* and *Dévi*, in the shape of two doves.

The worship of the dove seems to have been peculiar to *India*, *Arabia*, *Syria*, and *Assyria*. We read of *Semiramis* being fed by doves in the desart; and of her vanishing at last from the sight of men, in the shape of a dove; and, according to the *Puránás*, *Capótési*, or the dove, was but a manifestation of *Sami-Rámá*.

The dove seems to have been in former times the device of the *Assyrian*, as the eagle was of the *Roman* empire; for we read in *Isaias**, "And the inhabi-"ants of this country shall say in that day, such was

* *Isaias*, cap. xx. in fine.

"our expectation! behold whither we wanted to fly "for help from the face of the dove, but how could "we have escaped."

I have adhered chiefly to the translation of *Tremellius*, which appears the most literal, and to be more expressive of the idea which the prophet wished to convey to the *Jews*, who wanted to fly to *Egypt* and *Ethiopia*, to avoid falling into the hands of the *Assyrians*; but were to be disappointed by the fall of these two empires.

All commentators have unanimously understood *Assyria* by the *Dove*, and have translated the above passage accordingly. *Capótési*, or the *Assyrian Dove*, was also mentioned in a song, current in these countries, and which seems to refer to some misfortune that had befallen the *Assyrians*. The 56th Psalm is directed to be sung to the tune of that song, which was known to every body; and for this purpose the first verse, as usual, is inserted. "*The dove of dis-* "*tant countries is now struck dumb.*"

The *Hindus* further insist, that the *black stone* in the wall of the *Caaba*, is no other than the *Linga* or *Phallus* of *Máhá-dévá*; and that when the *Caaba* was rebuilt by *Mohammed (as they affirm it to have been)* it was placed in the wall, out of contempt; but the new converted pilgrims would not give up the worship of the *black stone*; and sinistrous portents forced the ministers of the new religion to connive at it. *Arabian* authors also inform us that *stones* were worshipped all over *Arabia*, particularly at *Mecca*; and *Al-shahrestanani** says, that the temple at *Mecca* was dedicated to *Zohal* or *Kyevun*, who is the same with *Saturn*. The author of the *Dabistan* declares posi-

* *Sale's Koran.*

tively that the *Hejar al aswad*, or the *black stone*, was the image of *Kyevun*. Though these accounts somewhat differ from those in the *Puránás*, yet they shew that this *black stone* was the object of an idolatrous worship from the most remote times.

The *Mussulmans*, in order to palliate their idolatry towards it, have contrived other legends. *Kyevun* is the *Chyun* of Scripture, also called *Remphan*, which is interpreted the *God of Time*. If so, *Chyun*, or *Kyevun*, must be *Mahá-déva*, called also *Mahá-cála*, a denomination of the same import with *Remphan*; the *Egyptians* called *Horus*, the lord of time; and *Horus* is the same with *Hara*, or *Mahá-déva**.

The reason of this tradition is, that the *Sabians*, who worshipped the seven planets, seem to have considered *Saturn* as the lord of time, on account of the length of its periodical revolution; and it appears from the *Dabistan*, that some ancient tribes in *Persia* had contrived a cycle of years, consisting of the revolution of *Saturn* repeatedly multiplied by itself.

Asc'hala-st'há'n, or *Asc'halana-st'há'n*, is obviously *Ascalon*; there *Semiramis* was born, according to *Diodorus Siculus*, or according to the *Puránás*, there she made her first appearance.

Mahá-bhága-st'há'n is the *st'hán* or place of *Sami-Rámá*, in the characters of *Mahá-bhágá*, or the great and prosperous goddess. This implies also that she bestowed greatness and prosperity on her votaries.

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* See Dissertation on *Egypt*, &c. in the third volume of the *Asiatic Researches*.

We cannot but suppose that the *sthan* of *Máhá-bhágá* is the ancient town of *Mabog*, called now *Menbigz* and *Menbig*; the *Greeks* called it *Hierapolis*, or the holy city: it was a place of great antiquity; and there was a famous temple dedicated to the *Syrian* goddess, whose statue of gold was placed in the centre, between those of *Jupiter* and *Juno*. It had a golden dove on its head; hence some supposed it was designed for *Semiramis*; and it was twice every year carried to the sea-side in procession. This statue was obviously that of the great goddess, or *Mahábhágá-devi*, whose history is intimately connected with that of the *Dove* in the western mythologist, as well as in the *Puránás*.

An ancient author* thus relates her origin: "Dicitur et *Euphratis* fluvio ovum piscis *Columba* adsedisse dies plurimos, et exclusisse *Deam benignam* et misericordem hominibus ad *bonam vitam*." "It is related that a *Dove* hatched the egg of a fish, near the *Euphrates*, and that after many days of incubation came forth the *Goddess, merciful* and *propitious* to men, on whom she bestows eternal bliss." Others say that fishes rolled an egg upon dry land, where it was hatched by a *Dove*, after which appeared the *Syrian* Goddess.

Her origin is thus related in the *Puránás*: The *Yavanás* having for a long time vexed the inhabitants of *Cushadwíp*, they at last applied for protection to *Máhá-bhága-devi*, who had already appeared in that country in the characters of *Sami-Ráma* and *Capotési*, or *Isi*, in the shape of a *Dove*; they requested also that she would vouchsafe to reside amongst them. The merciful Goddess granted their request; and the

* *Lucius Amphelius* ad *Macrin.*

place where she made her abode was called the *st'-han*, or place of *Máhá-bhagá*.

The *Syrian* name of *Mabog* is obviously derived from *Maha-bhágá*. This contraction is not uncommon in the western dialects, derived from the *Sanscrit*; and *Hesychius* informs us that the Greeks pronounced the *Hindu* word *Máhá* (great) *Mái*. *Mabog* is mentioned by *Pliny*, where we read *Magog*; but Mr. *Danville* shews that it should be *Mabog*; I conclude from some manuscript copies. This is also confirmed by its present name, which is to this day *Manbig*, or *Manbeg*. We find it also called *Bambukeh* (Βαμβυχη *Bambyce*); and in *Niebuhr's* Travels it is also called *Bombâdsche*: I suppose for *Bombaksche* or *Mombigz*: but this is equally corrupted from *Má'ábhágá*. In the same manner we say *Bombay* for *Momba*; and what is called in *India Bambu* or *Pambu*, is called *Mambu* in *Thibet*.

The temple of *Mabog* was frequented by all nations; and amongst them were Pilgrims from *India*, according to *Lucian*, as cited by the author of the Ancient Universal History.

Mabog, or *Hierapolis*, was called also *Old Ninus*, or *Nineveh*, according to *Ammianus Marcellinus*, and *Philostratus*: and there is no mistake in *Diodorus Siculus* and *Otesias*, when they assert that there was a town called *Nineveh* near the *Euphrates*. Scripture also seems to place *Nineveh* thereabout; for it is said that *Rezen* was between *Nineveh* and *Calach*. And the situation of *Rezen*, called also *Resaina*, by ancient authors, and *Razain* by the moderns, is well known as well as that of *Calach* on the banks of the *Lycus*, now the *Zab*, to the eastward of the *Tigris*. *Nineveh*, of course, must have been to the westward of these two places, and falls where the *Old Ninus* is pointed out by *Ammianus*, *Philostratus*, &c.

Two places of the name are mentioned in the *Puránás*, under the name of *Lilast'hán*, the *st'hán* or place of *Li'lésá* or *Ninus*. There can be no doubt, in my humble opinion, of their identity; for *Sami-Rámá* is obviously *Semiramis*. *Ninus* was the son of *Belus*, and, according to the *Puránás*, *Li'lésa* sprung from *Bá'léswara*, or *Balesa*; for both denominations, being perfectly synonymous, are indifferently used in the *Puránás*.

Nineveh on the *Tigris* seems to be the *st'hán* or *Li'lésa*, where he laid aside the shape and countenance of *Bálésa*, and assumed that of *Li'lésa*. The other place of *Lilesa*, which *Sami'-Rámá*, delighted with the beauty of the spot, chose for the place of her residence, is *Hierapolis*, called also *Ninus or Nineveh*; hence we find her statue in the temple of *Wahab'hácá*. It is said to have been situated near a deep pool, or small lake, called from that circumstance *Hradancità*; and the pool near the *Hierapolis* was described to be two fathoms deep. *Sami'-Ráma* is represented in a most amiable light in the *Puránás*, as well as her consort *Liléswara*, or *Lilésa*.

Stephanus of *Byzantium* says that *Ninus* lived at a place called *Telané*, previous to his building *Nineveh*; but this place, I believe, is not mentioned by any other author.

Ninus is with good reason supposed to be the *Assur* of Scripture, who built *Nineveh*; and *Assur* is obviously the *Iswara* of the *Puránás*, with the title of *Li'léswara*, *Li'lésa*, or *Ninus*. The word *Iswara*, though generally applied to deities, is also given in the *Puránás* to Kings; it signifies *Lord* and *Sovereign*.

With respect to the monstrous origin of *Bélésa*, and the thirty-one *Phálli*; my *Pandit*, who is an

astronomer, suspects it to be an attempt to reconcile the course of the moon to that of the sun, by dividing the synodical revolution into thirty-one parts, which may represent also three hundred and ten years. As this correction is now disused, he could give me no further information concerning it. To the event related is ascribed the origin of the *Linga* or *Phallus*, and of its worship: it is said to have happened on the banks of the *Cumud-vati*, or *Euphrates*; and the first *Phallus*, under the name of *Iswara-Linga*, was erected on its banks. This is confirmed by *Diodorus Siculus*, who says that *Semiramis* brought a *Obelisk* from the mountains of *Armenia*, and erected it in the most conspicuous part of *Babylon*: it was 150 feet high, and is reckoned, by some authors, as one of the seven wonders of the world*. The *Jews* in their *Talmud* allude to something of this kind; speaking of the different sorts of earths, of which the body of *Adam* was formed: they say that the earth which composed his generative parts, was brought from *Babylonia*.

The next place of worship is the *st'han* of *Anáyá-sa-dévi*: this, I think, is obviously the *Heiron tes Anaias* of *Strabo*, or the temple of the goddess *Anaia*, or *Anaias*, with its burning spring of *Naphtha*. They are upon a hillock, called *Corcura* by the ancients, and now known by the name of *Corcoor*: it is near *Kerkook*, and to the eastward of the *Tigris*. To this day it is visited by pilgrims from *India*; and I have been fortunate enough to meet with four or five who had paid their devotions in this holy place. I consulted them separately; and their accounts were as satisfactory as could be expected. They call it *Juálá-muc'hi*, or the flaming mouth.

This conflagration is minutely described by *Diodorus Siculus*†; who says, that in former times a mon-

* *Diod. Sic.* lib. 3. cap. 4. † *Ibid.* cap. 5.

ster called *Alcida*, who vomited flames, appeared in *Phrygia*; hence spreading along mount *Taurus*, the conflagration burnt down all the woods, as far as *India*: then, with a retrograde course, swept the forests of mount *Liban*, and extended as far as *Egypt* and *Africa*: at last a stop was put to it by *Minerva*.

The *Phrygians* remembered well this conflagration and the flood which followed it; but as they could not conceive that it could originate from a benevolent Goddess, they transformed her into a monster, called *Alcida*. *Alcida*, however, is an old *Greek* word, implying strength and power, and is therefore synonymous with *Sáca* or *Sácá-devi*, the principal form of *Sami-Ráma*, and other manifestations of the female part of nature.

Indeed, the names and titles of most of the *Babylonian* deities are pure *Sanscrit*: and many of them are worshipped to this day in *India*, or at least their legends are to be found in the *Puránás*.

Thus *Semiramis* is derived from *Sami-Rámési*, or *Sami-Rama*, and *Sámi-Rama-dévi*.

Militta from *Militia-Devi*, because she brings people together *(Connuba)*.

Shakka, or *Saca*, is from the *Sanscrit Sácta-dévi*, pronounced *Sácá* in the vulgar dialects: it implies strength and power.

Slamba, or *Salambo*, is from *Sarwámbá*, often pronounced *Salwámba*: it signifies the mother of all: and she is the *Magna Mater* of the western mythologists.

Dêvi is called also *Á'ntargati*, or *Antargatá*, because she resides within the body, or in the heart, and thereby gives strength and courage. This is the Goddess of Victory in *India*, and they have no other: it is declared in the *Puránás*, that she was called *Á'ntrast' hi* (a title of the same import with the former) in the forests of *Vishála-vana*, on the banks of the river *Tamasa*, in *Chándra-duip*: from *Á'ntrast' hi* the old *Britons*, or rather the *Romans*, made *Andraste*.

The *Babylonian* Goddess was called also the *Queen of Heaven*; and to this day a form of *Dêvi*, with the title of *Sverga rádni dêvi*, or *Iswi*, *Queen of Heaven*, is worshipped in *India*.

Rhea is from *Hriyá-devi*, or the bashful or modest Goddess.

Rakh is from *Racéswara*: a name of *Lunus*, from one of his favourite wives called *Raca*: it signifies also the full orb of the Moon.

Nabo, or *Nebo*, is *Iswara*, with the title of *Nava*, or *Naba*, the celestial.

Nargal is from *Anargaléswara*; that is, he who is independent.

Adram-melech is from *A'dharm-eswara*; for *Iswara* and *Melech*, in the *Chaldæan* language, are synonymous.

Adharmeswara is thus called, because he punishes those who deviate from the paths of justice and rectitude.

Anam-melech is from *Anam-eswara* or *Iswara*,

who, though above all, behaves to all with meekness and affability.

Nimrod is from *Níma-Rudra*, because *Rudra*, or *Mahá-déva*, gave him half of his own strength.

Vahni-st'hán, called also *Agni-st'hán*, is said in some *Puránás* to be in *Cusha-dwíp*; and in others, to be on the borders of it. It includes all the mountainous country from *Phrygia* to *Herat*. *Vahni-st'han* and *Agni-st'hán*, are denominations of the same import, and signify the country or seat of fire, from the numerous volcanoes and burning springs which are to be found all along this extensive range of mountains. The present *Azar-Báiján*, is part of it, and may be called *Vahni-st'hán* proper. *Azar*, in the old *Persian*, signifies fire; and *Báiján*, a mine or spring. This information was given to me by Mr. *Duncan*, resident of *Benares*, who was so kind as to consult on this subject with *Mehdi-Ali-Khán*, one of the *Aumils* of the *Zemindary* of *Benares*. He is a native of *Khorassan*, and well acquainted with the antiquities of his own country, and of *Iran* in general. According to him, the principal *Báiján*, or spring of fire, is at a place called *Baut-Cubeh**, in *Azar Báiján*. *Vahni-st'hán* is called also *Vahni-vyápta*, from the immense quantity of fire collected in that country. There are many places of worship remaining throughout *Iran*, still resorted to by devout pilgrims. The principal are *Balk* and the *Pyræum*, near *Herat*. *Hinglaz*, or *Anclooje*, near the sea, and about eighty miles from the mouth of the *Indus*: it is now deserted; but there remain twenty-four temples of *Bhaváni*. This place, however, is seldom visited, on account of the difficulties attending the journey to it.

* It is vulgarly called *Baku*.

Gangáwáz, near *Congo*, on the *Persian* Gulph, another place of pilgrimage, where are many caves, with springs in the mountains.

The *st'hán* of *Calyána-Ráya* and *Govinda-Ráya*, two incarnations of *Vishnu*, is in the centre of *Bussora*, on the banks of the *Euphrates*; and there are two statues carefully concealed from the sight of the *Mussulmans*.

Anáyásá-dévi-st'hán has been already mentioned; and the great *Juálá-muc'hi* is the designation of the springs of *Naphtha*, near *Baku*.

There is also another *Hindu* place of worship at *Barahein (El Katif)* and another at *Astrachan*, where the few *Hindus* who live there worship the *Volga*, under the name of *Súrya muc'hi-Ganga*; the legends relating to this famous river are to be found in the *Puránás*, and confirm the information of the pilgrims who have visited these holy places. There are still many *Hindus* dispersed through that immense country; they are unknown to the *Mussulmans*; and they pass for *Guebris*, as they call them here, or *Parsis*. There is now at *Benares* a *Bráhmin* of the name of *Dévidás*, who is a native of *Mesched*; he was introduced lately to my acquaintance by Mr. *Duncan*; and he informed me that it was supposed there were about 2000 families of *Hindus* in *Khorassan*; that they called themselves *Hindi*, and are known to the *Mussulmans* of the country under that appellation.

This, in my opinion, accounts for the whole country to the south of the *Caspian Sea*, from *Khorassan* and *Arrokhage*, as far as the *Black Sea* being called *India* by the ancients; and its inhabitants in various places *Sindi*: it is implicitly confirmed by the *Puránás*, in which it is said that the *Súrya-muc'hi-Ganga*,

or *Volga*, falls into the *Sea* of *Sind*. The *Hindus* near *Baku* and at *Astrachan*, call it the *New Sea*, because they say it did not exist formerly. They have legends about it, which however, my learned friend *Vidhyánáth* could not find in the *Puránás*.

According to the pilgrims I have consulted, there are about twenty or thirty families of *Hindus* at *Balk*; and *Eusebius* informs us, that there were *Hindus* in *Bactriana* in his time. There are as many families at *Gángáwáz*, or *Congo*; about one hundred at *Bussora*; and a few at *Bukarán*: these informed *Puránápurí*, a *Yógi* and famous traveller, called also *Urdhwabáhu*, because he always keeps his hands elevated above his head, that formerly they corresponded and traded with other *Hindus* on the banks of the river *Nila*, in the country of *Misr*; and that they had once a house or factory at *Cairo*; but that, on account of the oppression of the *Turks* and the roving *Arabs*, there had been no intercourse between them for several generations. There are no *Hindus* at *Anáyasádévi*, or *Corcoor*; but they compute a large number in the vicinity of *Baku*, and *Derbend*. The *Shroffs* at *Sámákhi* are *Banyans* or *Hindus*, according to the dictionary of Commerce, and of *Trevoux*, as cited in the *French* Encyclopædia.*

The *Cuttáni's* who live near *Derbend* are *Hindus*, as my friend *Purani-Puri* was told at *Baku* and *Astrachan*, in his way to *Moscow*; and their *Bráhmins* are said to be very learned; but, as he very properly observed, this ought to be understood relatively, on a comparison with the other *Hindus* in *Persia*, who are extremely ignorant.

* Ad vocem *Cheraffs*.

His relation is in a great measure confirmed by *Strahlenberg*, who calls them *Cubi Cubatzin*, and says that they live near *Derbend*, are a distinct people, supposed to be *Jews*, and to speak still the *Hebrew* language.

The *Sanscrit* characters might easily be mistaken for the black *Hebrew* letters by superficial observers, or persons little conversant in subjects of this nature.

The *Arani*, figuratively called the daughter of the *Sami*-tree, and the mother of fire, is a cubic piece of wood, about five inches in diameter, with a small hole in the upper part. A stick of the same sort of wood is placed in this cavity, and put in motion by a string held by two men, or fixed to a bow. The friction soon produces fire, which is used for all religious purposes, and also for dressing food. Every *Brahmin* ought to have an *Arani*; and when they cannot procure one from the *Sami*-tree, which is rather scarce in this part of *India*, they make it with the wood of the *Asvatt'ha*, or *Pippala*-tree. This is also a sacred tree, and they distinguish two species of it; the *Pippala*, called in the vulgar dialects *Pipal*, and the *Chalat palasha*. The leaves of this last are larger, but the fruit is smaller, and not so numerous as in the former species. It is called *Chalat palasha*, from the tremulous motion of its leaves. It is very common in the hills; and the vulgar name for it is *Pópala*; from which I suppose is derived the *Latin* word *Populus*; for it is certainly the trembling *Poplar* or *Aspen*-tree.

The festival of *Semiramis* falls always on the tenth day of the lunar month of *Aswina*, which this year coincided with the fourth of *October*. On this day lamps are lighted in the evening under the *Sami*-tree; offerings are made of rice and flowers, and some-

times strong liquors; the votaries sing the praise of *Sami'-Ramá-devá* and the *Samí*-tree; and having worshipped them, carry away some of the leaves of the tree, and earth from the roots, which they keep carefully in their houses till the return of the festival of *Semiramis* in the ensuing year.

XXVII.

ON THE ANDAMAN ISLANDS.

BY LIEUT. R. H. COLEBROOKE.

THE *Andaman Islands* are situated on the eastern side of the bay of *Bengal**, extending from north latitude 10° 32′ to 13° 40′. Their longitude is from 92° 6′ to 61° 59′ east of *Greenwich*. The *Great Andaman*, or that portion of the land hitherto so called, is about one hundred-and-forty *British* miles in length, but not more than twenty in the broadest parts. Its coasts are indented by several deep bays, affording excellent harbours, and it is intersected by many vast inlets and creeks, one of which has been found to run quite through, and is navigable for small vessels. The *Little Andaman* is the most southerly of the two, and lies within thirty leagues of the

* It is perhaps a wonder, that islands so extensive, and lying in the track of so many ships, should have been, till of late years, so little known; that while the countries by which they are almost encircled, have been increasing in population and wealth, having been from time immemorial in a state of tolerable civilization, these islands should have remained in a state of nature, and their inhabitants plunged in the grossest ignorance and barbarity.

The wild appearance of the country, and the untractable and ferocious disposition of the natives, have been the causes, probably, which have deterred navigators from frequenting them; and they have justly dreaded a shipwreck at the *Andamans* more than the danger of foundering in the ocean; for although it is highly probable, that in the course of time many vessels have been wrecked upon their coasts, an instance does not occur of any of the crews being saved, or of a single person returning to give any account of such a disaster.

island *Carnicobar*. Its length is 28 miles by 17 in breadth, being more compact, but does not afford any harbour, although tolerable anchorage is found near its shores. The former is surrounded by a great number of smaller islands.

The shores of the main island, and indeed of all the rest, are in some parts rocky, and in a few places are lined with a smooth and sandy beach, where boats may easily land. The interior shores of the bays and creeks are almost invariably lined with mangroves, prickly fern, and a species of wild rattan; while the inland parts are covered with a variety of tall trees, darkened by the intermixture of creepers, parasite-plants, and underwood; which form altogether a vast and almost impervious forest, spreading over the whole country. The smaller islands are equally covered with wood; they mostly contain hills of a moderate height; but the main island is distinguished by a mountain of prodigious bulk, called from its shape the Saddle-Peak; it is visible in clear weather at the distance of twenty-five leagues, being nearly two thousand four hundred feet in perpendicular height. There are no rivers of any size upon these islands, but a number of small rills pour down from the mountains, affording good water, and exhibiting in their descent over the rocks, a variety of little cascades, which are overshaded by the superincumbent woods.

The soil is various in different parts of these islands*; consisting of black rich mould, white and dark coloured clays, light sandy soil, clay mixed with pebbles of different colours, red and yellow earth; but the black mould is most common. Some white cliffs

* I am indebted to Major *Kyd* and Captain *Archibald Blair* for many of the subsequent remarks. The latter was employed by government in surveying these islands, and has the credit of having furnished the first complete and correct Chart of the *Andamans*.

are met with among the shores, which appear to have been originally clay, with a mixture of sand, hardened by time into the consistence of stone, but might be cut, and would probably answer for building. Near the southern extremity of the great island, where it is mountainous and rocky, some indications of minerals have appeared, particularly of tin. There is also a kind of freestone, containing a yellow shining spar, resembling gold-dust. Some of the hills bordering the coasts exhibit blue shistous strata at their bases, with the brescia, or pudding-stone; and some specimens of red ochre have been found, not unlike cinnabar.

The extensive forests with which these islands are over-run, produce a variety of trees fit for building, and many other purposes. The most common are the poon, dammer, and oil-trees; red wood, ebony, cotton-tree, and *buddaum* or almond-tree; soondry, chingry, and bindy; *Alexandrian* laurel, poplar, and a tree resembling the sattin-wood; bamboos, and plaas, with which the natives make their bows; cutch, affording the extract called *Terra Japonica*; the *Melori*, or *Nicobar* bread-fruit; aloes, ground rattans, and a variety of shrubs. A few fruit-trees have been found in a wild state; but it is remarkable that cocoa-nuts, so common in other tropical countries, are here almost unknown. Many of the trees afford timbers and planks fit for the construction of ships, and others might answer for masts. A tree grows here to an enormous size, one having been found to measure thirty feet in circumference, producing a very rich dye, that might be of use in manufactures.

The only quadrupeds yet discovered in these islands are wild hogs, monkeys, and rats. Guanas, and various reptiles abound; among the latter is the green

snake, very venemous; centipedes of [illegible] inches long, and scorpions.

A variety of birds are seen in the woods; the most common are pigeons, crows, parroquets, king fishers, curlews, fish-hawks, and owls. A species of humming bird, whose notes are not unlike the cuckoo's, is frequently heard in the night.

The principal caverns and recesses, composing part of the coast, give shelter to the birds that build the edible nests: an article of commerce in the *China* market, where they are sold at a very high price. It has been thought that these nests are formed from a glutinous matter exuding from the sides of the caverns where these birds, during their nidification, resort. It is not known whether they emigrate; but the period of their incubation takes place in *December*, and continues till *May*. Not more than two white spotless eggs have been found in their nests; but they have been further supposed to breed monthly.

The harbours and inlets from the sea are plentifully stocked with a variety of fish; such as mullets, soles, pomfret, rock-fish, skate, gurnards, sardinas, roe-balls, sable, shad, aloose, cockup, grobers, seer-fish, old wives, yellow tails, snappers, devil-fish, cat-fish, prawns, shrimps, cray-fish, and many others: a species resembling the whale, and sharks of an enormous size, are met with. A variety of shell-fish are found on the reefs, and in some places oysters of an excellent quality. Of the many madrapors, coralines, zoophites, and shells, none have yet been discovered but such as are found elsewhere.

The *Andaman Islands* are inhabited by a race of men the least civilized, perhaps, in the world; being nearer

to a state of nature than any people we read of. Their colour is of the darkest hue, their stature in general small, and their aspect uncouth. Their limbs are ill formed and slender, their bellies prominent, and, like the *Africans*, they have woolly heads*, thick lips, and

* In this respect they differ from all the various tribes inhabiting the continent of *Asia*, or its islands. A story is somewhere told of a ship full of *African* slaves, of both sexes, having been cast away at the *Andamans*; and that having put to death their masters and the ship's crew, they spread themselves over, and peopled the country. This story does not appear to have been well authenticated, nor have I ever met with the particular author who relates it. They have been asserted by some to be cannibals, and by others (*vide* Captain *Hamilton's* Voyage, and all the Geographical Dictionaries) to be a harmless and inoffensive people, living chiefly on rice and vegetables. That they are cannibals has never been fully proved, although from their cruel and sanguinary disposition, great voracity, and cunning modes of lying in ambush, there is reason to suspect, that in attacking strangers they are frequently impelled by hunger, as they invariably put to death the unfortunate victims who fall under their hands. No positive instance, however, has been known of their eating the flesh of their enemies; although the bodies of some whom they have killed, have been found mangled and torn. It would be difficult to account for their unremitting hostility to strangers, without ascribing this as the cause, unless the story of their origin, as abovementioned, should be true; in which case they might probably retain a tradition of having once been in a state of slavery. This in some degree would account for the rancour and enmity they shew; and they would naturally wage perpetual war with those whom they might suspect were come to invade their country, or enslave them again.

It would appear that these islands were known to the ancients (see Major *Rennel's* Memoirs, introduction, page xxxix). They are mentioned, I believe, by *Marco Polo;* and in the ancient accounts of *India* and *China*, by two *Mohammedan* travellers, who went to those parts in the ninth century (translated from the *Arabic* by *Eusebius Renaudot*) may be seen the following curious account: —"Beyond these two islands (*Nejabalus*, probably *Nicobars*) lies "the sea of *Andaman;* the people on this coast eat human flesh "quite raw; their complexion is black, their hair frizzled, their "countenance and eyes frightful, their feet are very large and almost "a cubit in length, and they go quite naked. They have no em- "barkations; if they had, they would devour all the passengers "they could lay hands on," &c.

flat noses. They go quite naked, the women wearing only at times a kind of tassel, or fringe, round the middle; which is intended merely for ornament, as they do not betray any signs of bashfulness when seen without it. The men are cunning, crafty, and revengeful; and frequently express their aversion to strangers in a loud and threatening tone of voice, exhibiting various signs of defiance, and expressing their contempt by the most indecent gestures. At other times they appear quiet and docile, with the most insidious intent. They will affect to enter into a friendly intercourse, when, after receiving with a show of humility whatever articles may be presented to them, they set up a shout, and discharge their arrows at the donors. On the appearance of a vessel or boat, they frequently lie in ambush among the trees, and send one of their gang, who is generally the oldest among them, to the water's edge, to endeavour by friendly signs to allure the strangers on shore. Should the crew venture to land without arms, they instantly rush out from their lurking-places, and attack them. In these skirmishes they display much resolution, and will sometimes plunge into the water to seize the boat; and they have been known even to discharge their arrows while in the act of swimming. Their mode of life is degrading to human nature, and, like brutes, their whole time is spent in search of food. They have yet made no attempts to cultivate their lands, but live entirely upon what they can pick up, or kill. In the morning they rub their skins with mud, and wallow in it like buffaloes, to prevent the annoyance of insects, and daub their woolly heads with red ochre, or cinnabar. Thus attired, they walk forth to their different occupations. The women bear the greatest part of the drudgery in collecting food, repairing to the reefs at the recess of the tide, to pick up shell-fish, while the men are hunting in the woods, or wading in the water to shoot fish with their bows and arrows. They

are very dexterous at this extraordinary mode of fishing; which they practise also at night, by the light of a torch. In their excursions through the woods, a wild hog sometimes rewards their toil, and affords them a more ample repast. They broil their meat or fish over a kind of grid, made of bamboos; but use no salt, or any other seasoning.

The *Andamaners* display at times much colloquial vivacity, and are fond of singing and dancing; in which amusements the women equally participate. Their language is rather smooth than guttural; and their melodies are in the nature of recitative and chorus, not unpleasing. In dancing they may be said to have improved on the strange republican dance asserted by *Voltaire* to have been exhibited in *England*: "*Ou dansant a la ronde, chacun donne des coups de pieds* "*a son voisin, et en recoit autant.*" The *Andamaners* likewise dance in a ring, each alternately kicking and slapping his own breech, *ad libitum*. Their salutation is performed by lifting up a leg, and smacking with their hand the lower part of the thigh.

Their dwellings are the most wretched hovels imaginable. An *Andaman* hut may be considered the rudest, and most imperfect attempt of the human race to procure shelter from the weather; and answers to the idea given by *Vitruvius*, of the buildings erected by the earliest inhabitants of the earth. Three or four sticks are planted in the ground, and fastened together at the top, in the form of a cone, over which a kind of thatch is formed with the branches and leaves of trees. An opening is left on one side, just large enough to creep into; and the ground beneath is strewed with dried leaves, upon which they lie. In these huts are frequently found the sculls of wild hogs, suspended to the roofs.

Their canoes are hollowed out of the trunks of trees by means of fire and instruments of stone, having no iron in use amongst them, except such utensils as they have procured from the *Europeans* and sailors who have lately visited these islands; or from the wrecks of vessels formerly stranded on their coasts. They use also rafts, made of bamboos, to transport themselves across their harbours, or from one island to another. Their arms have already been mentioned in part; I need only add, that their bows are remarkably long, and of an uncommon form; their arrows are headed with fish-bones, or the tusks of wild hogs; sometimes merely with a sharp bit of wood hardened in the fire; but these are sufficiently destructive. They use also a kind of shield; and one or two other weapons have been seen amongst them. Of their implements for fishing, and other purposes, little can be said. Hand-nets of different sizes are used in catching the small fry; and a kind of wicker-basket, which they carry on their backs, serves to deposit whatever articles of food they can pick up. A few specimens of pottery-ware have been seen in these islands.

The climate of the *Andaman Islands* is rather milder than in *Bengal*. The prevailing winds are the south-west and north-east monsoons, the former commencing in *May*, and bringing in the rains; which continue to fall with equal, if not greater, violence till *November*. At this time the north-east winds begin to blow, accompanied likewise by showers, but giving place to fair and pleasant weather during the rest of the year. These winds vary but little, and are interrupted only at times by the land and sea-breezes. The tides are regular, the floods setting in from the west, and rising eight feet at the springs, with little variation in different parts. On the north-east coast

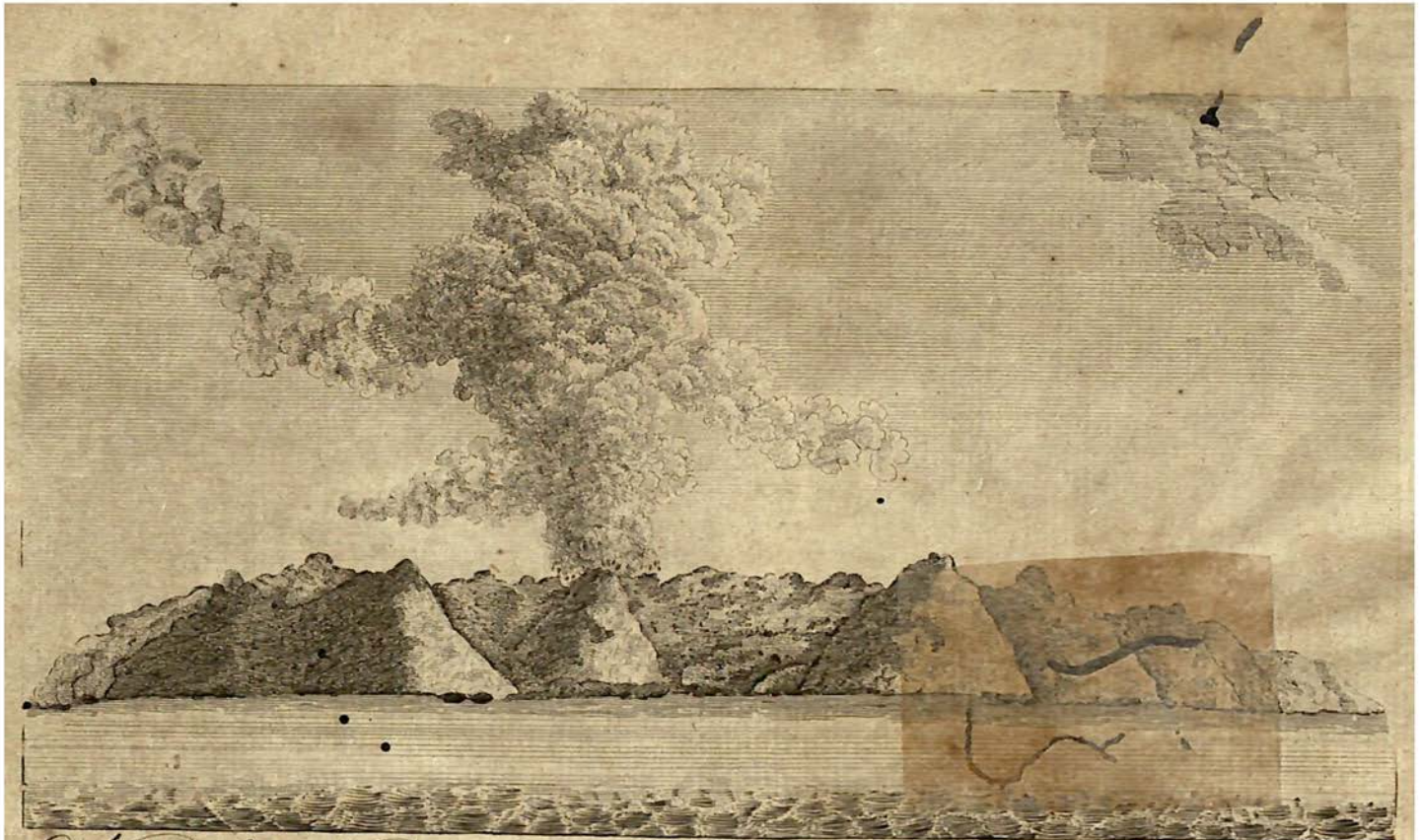
it is high water at the full and change of the moon at 8h 33′. The variation of the needle is 2° 30′ easterly.

Specimen of the Andaman Language.

Andaman island, or native country,	Mincopie
Ant,	Ahooda
Ant, white in its winged state,	Doughay
Arrow,	Buttohie
Arm,	Pilie
Bat,	Vilvila
Bamboo,	Otallie
Bangle,	Alai
Basket,	Teregay
Black,	Cheeghieooga
Blood,	Cochengohee
Bead,	Tahee
To Beat,	Ingo taheya
Belly,	Napoy
To bind,	Totoba oto goley toha
Bird,	Lohay
To bite,	Moepaka
Boat,	Loccay
Boar,	Stohee
Bow,	Tongie
Bow-string,	Geetahie
Breast,	Cah
Bone,	Geetongay
Charcoal,	Wehée
Chin,	Pitang
Cold,	Choma
Cocoa-nut	Bollatee
Cotton cloth,	Pangapee
To cough,	Ingotahey
Crow,	Nohay
To cut,	Hojeeha
Door,	Tang
To drink,	Meengohee
Earth,	Totongnangee
Ear,	Quaka
To eat,	Ingelholiah
Elbow,	Mohalajabay
Eye,	Jabay
Finger,	Momay
Fire,	Mona
Fish,	Nabohee
Fish-hook,	Atabea
Flesh,	Woohee
Foot,	Gookee
Friend,	Padoo
Frog,	Etolay
Goat,	Kokee
To go,	Oosseema
Grass,	Tohobee
Hair,	Ottee
Hand,	Gonie *or* Monie
Head,	Tabay
Honey,	Lorkay
Hot,	Hooloo
House,	Beaday
Jack Fruit,	Abay
Jackall,	Omay
Iron, or any Metal,	Dohie
Kiss,	Itolie
Knee,	Ingolay
To laugh,	Onkeomai
Leaf of a Tree,	Tongolie
Leg,	Chigie

Man, - -	Camolan	Smoke, - -	Boleenee
Moon, - -	Tabie	To sing, - -	Gokobay
Musqueto, -	Hohenangee	To sit down, -	Gongtohee
Mouth, - -	Morna	Shadow, -	Tengtohee
		To sleep, -	Comoha
Nail, - -	Mobejedanga	To sneeze, -	Ohscheka
Neck, - -	Tohie	To spit, - -	Inkahoangy
Net, - -	Botolee	To swim, -	Quaah
Nose, - -	Mellee	To swallow, -	Seebay
		Sky, - - -	Radamo
Paddle, or Oar,	Mecal	Star, - - -	Cholobay
Pain, - -	Alooda	Stone, - -	Woolay
Palm, - -	Dolai	Sun, - -	Ahay
Paper, - -	Pangpoy		
Pike, - -	Woohalay	To take up, -	Catoha
To pinch, -	Ingee Genecha	Thigh, - -	Poye
Plantain-tree,	Cholellee	Teeth, - -	Mahoy
Pot, - -	Bootchoohie	Tongue, - -	Talie
To pull,	Totobati Gehooa	Thunder and lightning,	Maufay - Maccee
Rain, - -	Oye,	To wash, -	Inga doha
Red, - -	Gheallop	Wasp, -	Bohomakee
Road, - -	Echollee	To walk, -	Boony-jaoa
To run, - -	Gohabela	Water, - -	Migway
To scratch -	Inkahey aha	To weep, -	Oana-wannah
Seed, - -	Kheetongay	Wind, - -	Tomjamay
Sheep,* - -	Neena	Wood, - -	Tanghee

* It may appear surprising that they should have names for animals that are not found in their islands. This circumstance may tend to confirm the story of their origin.



View of the Volcano on Barren Island bear.d East one Mile distant

XXVIII.

ON BARREN ISLAND, AND ITS VOLCANO.

BY LIEUT. R. H. COLEBROOKE.

ABOUT fifteen leagues to the eastward of the *Andaman Islands* lies an island which navigators, from its appearance, have justly called *Barren*. On the 12th of *May*, 1787, Captain *Kyd* and myself, being on board the *Trial* Snow, on a voyage to *Pulo Penang*, *Barren Island* in sight, bearing SSW. seven leagues distant, saw a column of smoke ascending from its summit, and by the help of our glasses plainly perceived it to arise from a hill nearly in its centre, around which appeared an extensive valley, or crater: but being becalmed, we could not approach nearer to examine it.

The following account of this remarkable island is given by Captain *Blair*, in his report of the Survey of the *Andaman Islands*.

" I left that coast *March* the 21st, and landed on " *Barren Island* on the 24th.---The volcano was in " a violent state of eruption, bursting out immense " volumes of smoke, and frequently showers of red- " hot stones. Some were of a size to weigh three or " four tons, and had been thrown some hundred " yards past the foot of the cone. There were two.

" or three eruptions while we were close to it; seve-
" ral of the red-hot stones rolled down the sides of
" the cone, and bounded a considerable way beyond
" its. The base of the cone is the lowest part of the
" island, and very little higher than the level of the
" sea. It arises with an acclivity of 32° 17′ to the
" height of 1800 feet nearly, which is also the eleva-
" tion of the other parts of the island.

" From its present figure it may be conjectured
" that the volcano first broke out near the centre of
" the island, or rather towards the north-west; and
" in a long process of time by discharging, consum-
" ing, and undermining, has brought it to the pre-
" sent very extraordinary form, of which a very cor-
" rect drawing by Lieutenant *Wales*, will impress a
" distant idea.

" Those parts of the island that are distant from
" the volcano, are thinly covered with withered shrubs
" and blasted trees. It is situated in latitude 12° 15′
" north, and fifteen leagues east of the northernmost
" island of the *Archipelago**, and may be seen at the
" distance of twelve leagues in clear weather. A
" quarter of a mile from the shore, there is no ground
" with 150 fathoms of line."

REMARK.

From the very singular and uncommon appearance of this island, it might be conjectured that it has been thrown up entirely from the sea, by the action of subterranean fire. Perhaps, but a few centuries ago, it had not reared itself above the waves, but might have been gradually emerging from the bottom of the ocean long before it became visible; till

* The easternmost cluster of the *Andaman Islands*.

at length it reached the surface, when the air would naturally assist the operation of the fire that had been struggling for ages to get vent, and it would then burst forth. The cone or volcano would rapidly increase in bulk, from the continual discharge of lava and combustible matter; and the more violent eruptions which might have ensued at times, when it would throw up its contents to a greater elevation and distance, might have produced that circular and nearly equidistant ridge of land we see around.

If this conjecture should gain credit, we may suppose not only many islands, but a great portion of the habitable globe, to have been thrown up by volcanos, which are now mostly extinguished. Many hills and islands now clothed with verdure, bear evident marks of having once been in this state. A ground plan of *Barren Island* would so exactly resemble some of the lunar spots, as seen through a good telescope when their shadows are strong, that I cannot help thinking there are also many more volcanos in the moon than have yet been discovered by a celebrated modern astronomer*. Those remarkable valleys, or cavities, discernible on her disk, have many of them a single hill in their centre, and are surrounded by a circular ridge of a similar appearance.

Query. May not the moon be surrounded by an atmosphere of pure air, which differing essentially in its properties from the atmosphere of our earth, might account for some of the phenomena of her appearance to us? An atmosphere of this sort might be so transparent as not to refract the rays of light in a sensible degree, or to produce the least change in the appearance of a star passing through it when an occultation

* *Herschell.*

is observed. At the same time, it would increase in a high degree, the inflammability and combustion of matter, so as to produce volcanos; and if we suppose the moon to have neither seas nor vegetation on her surface, the sun's light would be more strongly reflected than from the earth, where the rays are liable to absorption by water and vegetables.

XXIX.

Extract from a Diary of a Journey over the Great Desart, from Aleppo to Bussora, in April 1782. *Communicated by Sir* WILLIAM DUNKIN, *and published with a View to direct the Attention of future Travellers to the Ruins described in it.*

APRIL 16.

SET off at five in the morning; encamped at five in the evening; the day intensely hot; the soil in general sandy; some few shrubs and bushes, but now quite brown, and so dry, that with the least touch they fall to powder; many stalks of lavender and rosemary; and in very dry red sand several scarlet tulips; other sorts new to me, one of a singular kind, in colour and smell like a yellow lupin, but in figure like the cone of a fir-tree, from ten to twelve inches long.

After about two hours in this sort of country, the ground appeared more verdant and firm; we then came to some very extraordinary ruins our *Shaikh* had seen, but never had approached them before; we prevailed on him; he called the place *Castrohuoin;* another *Arab* called it *Calmay;* our *Armenians,* who interpreted for us in very bad *Italian,* called it *Castroduo fratilli* (I try to give the names from their mode of pronouncing); what we first saw was a square, each side about 400 yards long. The walls forty feet high, yet entire in many places; at each angle there is a circular tower, two others in each of the sides; they rise much higher than the walls; the towers and the walls constructed with very large blocks of cut stone. To what use the hollow of the square had

been applied, I could form no conjecture: in it are immense blocks of cut stone, and segments of arches of different dimensions, tumbled together in monstrous heaps. Near to the gateway by which we entered, two arches remain perfect, a third nearly so; they were probably carried all along the inside of (but distinct at least twenty feet from) the wall. These arches spring from very slender pillars, each pillar a single shaft; the arches are nearly semicircular, of the same beautiful white stones as the pillars. About a quarter of a mile from this square there is another, which appears to be a fourth part less; the entrance into this is under the loftiest as well as the widest arch of stone I ever saw: I had no means of measuring, which I much regretted: I cannot draw, which I regretted much more. The proportions of the pillars, and of the arch which they support, conveyed to me something more just and beautiful than I can describe. The inside of the arch is richly ornamented with sculpture; at the sides there are niches, I suppose, for statues; the outer face of the building is composed of great blocks of stone as the greater square; and in many places yet entire, appear to be as well chisseled and jointed as the best constructed marble building I ever saw, even at *Venice*. The height of the wall seems to be equal to that of the greatest square; the thickness, which from some breaches quite through may be observed, from seven to eight feet, all through of the same stone, with little, if any, cement: the number and disposition of the towers the same as in the other; but in this, where the towers rise above the wall, they are more ornamented; two circles or bands of sculpture at equal distances appear relieved from the body of each tower: but as all the tops are broken off, I could not guess how they had been closed. The sculpture on the inside of the great arch of entrance, and on many of the fragments of prostrated pillars,

appear like those of Mr. *Wood's* plates of the ruins of *Palmyra*. Over the entrance-arch on the inside, are some remains of an inscription in *Arabic*; but so defaced, that our *Shaikh*, who reads and writes *Arabic*, could not make out one word. All along the inside of this square, arches, formed of the finest brick, are constructed; they project from the wall about thirty feet, and are about twenty feet high over the arches; and close up to the wall is a platform of earth perfectly level, and now covered with rich and verdant herbage. No vestige of buildings appear in the hollow of this square, but many fragments of pillars lie in ruins; some are of brick, and so cemented, that it must be as difficult to separate their parts as if they were solid blocks of stone. There are no openings in the walls from which any thing could have been discharged: in the towers there are openings, at regular distances, which seem to have been designed to admit light only: not for any hostile purpose. Equidistant from each of the squares is a building of the same sort of stone, about fifteen feet; though it appears to have been much higher, it is still considerably more lofty than the other buildings: the stairs by which this was ascended appear perfect from about twelve feet above the ground; what were lower, now a heap of rubbish; there does not remain the appearance of any communication between this and the other buildings; all the interjacent ground is level, and now verdant; no stream or well appears nearer than the well we stopt at yesterday, about six hours from hence. If this district could be supplied with water, it would be rich indeed; for several miles onward we thought we discovered the remains of trenches or cuts for the conducting of water over the plain. The *Arabs* were entirely ignorant respecting these extraordinary buildings; when, or by whom erected, or when destroyed. The *Shaikh* hurried us away, very much dissatisfied that we had lost so much time; he swears he never will come near it

again: the distance from *Aleppo* is six days journey. The *Shaikh* says that we are now about forty miles from *Palmyra*, which is on our right, and about fifty from the *Euphrates*, on our left. No person at *Aleppo* gave me any hint of such a place. The gentlemen of our factory at *Bussora* had never heard of it.

XXX.

PROSOPIS ACULEATA. KŒNIG.

Tshamie of the Hindus in the Northern Circars.

BY DOCTOR ROXBURGH.

THIS grows to be a pretty large tree, is a native of most parts of the coast, chiefly of low lands at a considerable distance from the sea, and may be only a variety of *P. Spicigera*, for the thorns are in this sometimes wanting; it flowers during the cold, and beginning of the hot seasons.

Trunk tolerably erect, bark deeply cracked, dirty ash-colour.

Branches irregular, very numerous, forming a pretty large shady tree.

Prickles scattered over the small branches; in some trees wanting.

Leaves alternate, generally bipinnate, from two to three inches long; pinnæ from one to four, when in pairs opposite, and have a gland between their insertions.

Leaflets opposite, from seven to ten pair, obliquely lanced, smooth, entire, about half an inch long, and one-sixth broad.

Stipules none.

Spikes several, axillary, filiform, nearly erect.

Bracts minute, one-flowered, falling.

Flowers numerous, small, yellow, single, approximated.

Calyx below, five-toothed.

Filaments united at the base. *Anthers* incumbent, a white gland on the apex of each, which falls off soon after the flower expands. *Style* crooked. *Stigma* simple.
Legume long, pendulous, not *inflated.*
Seeds many, lodged in a brown mealy substance.

The pod of this tree is the only part used. It is about an inch in circumference, and from six to twelve long; when ripe, brown, smooth, and contains, beside the seeds, a large quantity of a brown mealy substance, which the natives eat; its taste is sweetish and agreeable; it may therefore be compared to the *Spanish Algaroba*, or locust-tree. *(Ceratonia Siliqua, Linn.)*

NOTE.

In compliance with *Dr. Kœnig's* opinion, I have called this a *Prosopis*, though I am aware that the antheral glands give it a claim to the genus Adenanthera.

TO THE

RIGHT HON. SIR JOHN SHORE, BART.

GOVERNOR-GENERAL,

AND

PRESIDENT OF THE ASIATIC SOCIETY.

DEAR SIR,

I HAVE had from Mr. *Goldingham* (one of the Honourable Company's astronomers at *Fort Saint George*, a person of much ingenuity, and who applies himself to the study of antiquities) some drawings taken from the cave on the island of *Elephanta:* they are the most accurate of any I have seen, and accompanied with a correct description. This gentleman argues ably in favour of its having been an *Hindu* temple; yet I cannot assent to his opinion. The immense excavations cut out of the solid rocks at the *Elephanta*, and other caves of the like nature on the island of *Salsette*, appear to me operations of too great labour to have been executed by the hands of so feeble and effeminate a race as the aborigines of *India* have generally been held to be, and still continue: and the few figures that yet remain entire, represent persons totally distinct in exterior from the present *Hindus*, being of a gigantic size, having large prominent faces, and bearing some resemblance to the *Abyssinians*, who inhabit the country on the west side of the *Red Sea*, opposite to *Arabia*. There is no tradition of these caves having been frequented by the *Hindus* as places of worship; and at this period no *poojah* is performed at any of them; and they are scarcely ever visited by the natives. I recollect particularly, that *Ragonath Rou*, when at *Bombay*, did not at all hold them in any degree of veneration.

I flatter myself that you, Sir, will agree with me in thinking the accompanying Memoir deserving of being inserted in our proceedings.

Mr. *Goldingham* acquaints me, that he has paid two visits to some curious remains of antiquity about thirty-five miles southerly of *Madras*, commonly known by the name of the *Seven Pagodas*. He promises to transmit to me his remarks on these curiosities, with copies of the inscriptions, which are in characters unknown to the people of the district. He declares himself highly ambitious of the favour of being admitted into our Society; and I shall be much gratified in being instrumental to his obtaining that favour, from a conviction that he will greatly add to our stock of information, and prove an useful member.

I cannot conclude an address to you, Sir, as the worthy successor of the gentleman who lately presided over our Society with so much credit to himself and benefit to the public, without adverting to the memory of Sir *William Jones*, whose universal science and ardent zeal for diffusing knowledge, I have had so many occasions to admire during the course of an acquaintance of twenty-five years.

I have the honour to be, with the greatest respect,

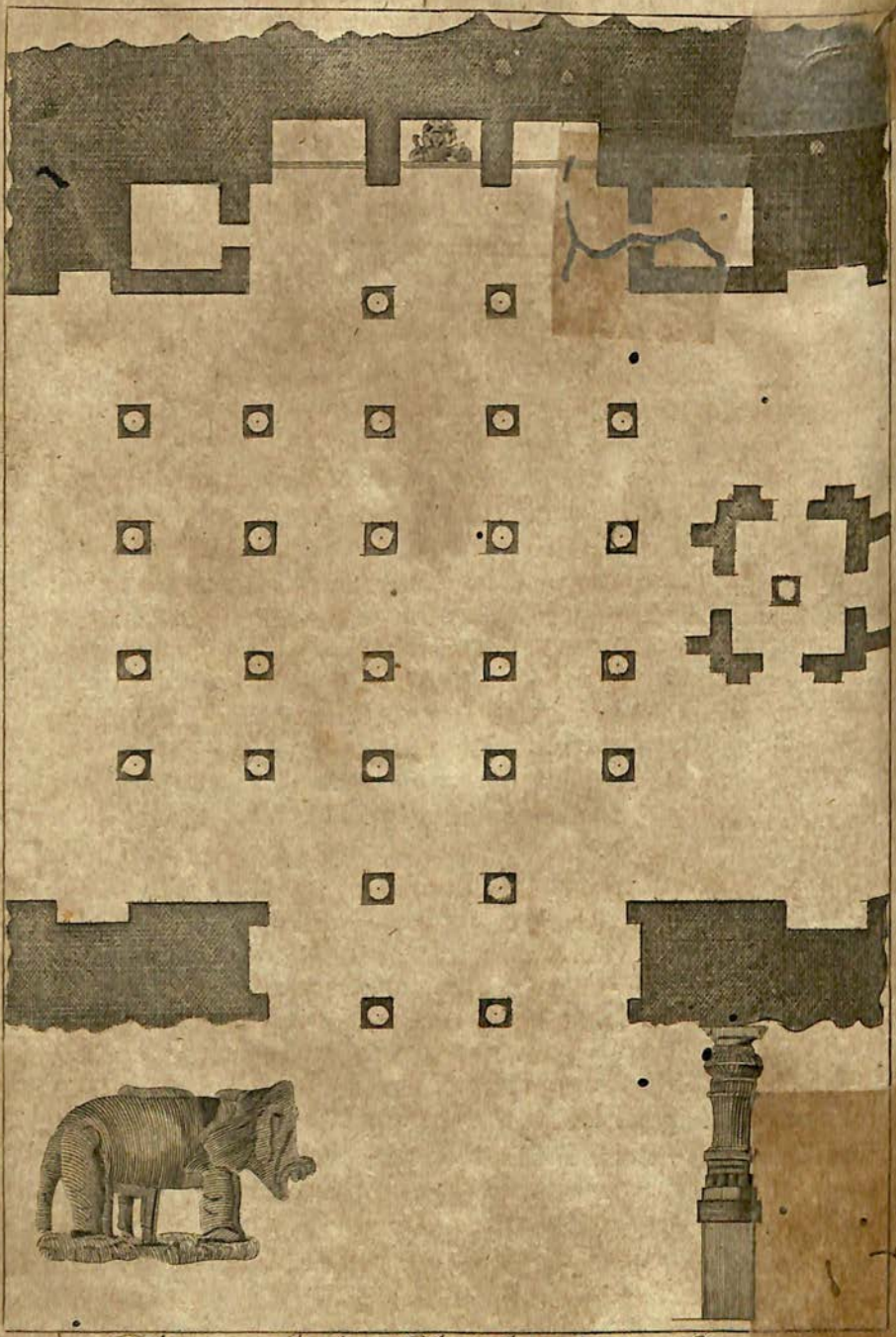
Dear Sir,

Your most faithful and most obedient servant,

J. CARNAC.

Calcutta,
29th July, 1795.

the Wall, at the upper End of the Cave, in the Island of Elephanta



Plan of the Elephanta Cave

XXXI.

SOME ACCOUNT OF THE CAVE IN THE ISLAND OF ELEPHANTA.

BY J. GOLDINGHAM, ESQ.

THE *Elephanta Cave*, which is situated in a small island in the harbour of *Bombay*, has deservedly attracted the attention of the curious; an elephant of black stone, large as the life, is seen near the landing-place, from which the island probably took its name: the cave is about three quarters of a mile from the beach; the path leading to it lies through a valley; the hills on either side beautifully clothed, and, except when interrupted by the dove calling to her absent mate, a solemn stillness prevails; the mind is fitted for contemplating the approaching scene.

The cave is formed in a hill of stone; its massy roof is supported by rows of columns regularly disposed, but of an order different from any in use with us*; gigantic figures, in relief, are observed on the walls; these as well as the columns are shaped in the solid rock, and by artists, it would appear, possessed of some ability, unquestionably of astonishing perseverance. Several of the columns have been levelled, and the figures mutilated, as I am informed, by the *Portuguese*, who were at the trouble (and no small one) of dragging cannon up the hill, for the better execution of this exploit.---Destructive Superstition

* See the sketch of one of the pillars.

seeks not for merit; she commits to the flames and to destruction, members of a community most valuable, and structures doing honour to human ability!

The wall at the upper end of the cave is crowded with sculpture; the attention is first arrested by a grand bust, representing a being with three heads; the middle face is presented full, and expresses a dignified composure; the head and neck splendidly covered with ornaments. The face on the left is in profile, and the head-dress rich; in one of the hands is a flower, in the other a fruit resembling a pomegranate; a ring, like that worn by the *Hindus* at present, is observed on one of the wrists; the expression of the countenance by no means unpleasant. Different is the head on the right; the face is in profile, the forehead projects, the eyes stare; snakes supply the place of hair, and the representation of a human skull is conspicuous on the covering of the head; one hand grasps a monstrous *Cobra de Capella* (the hooded snake) the other a smaller; the whole together calculated to strike terror into the beholder. The height of this bust is about *eighteen* feet, and the breadth of the middle face about *four*; but the annexed drawing of this piece of sculpture will give a better idea of it perhaps than words.

Each side of this niche is supported by a gigantic figure leaning on a dwarf, as in the drawing.

A niche of considerable dimensions, and crowded with figures, on either side the former; in the middle of the niche, on the right, stands a gigantic figure, apparently female, but with *one breast* only. This figure has four arms, the foremost right hand is leaning on the head of a bull, the other grasps a *Cobra de Capella*, wile a circular shield is observed in the inner left hand; the head is richly ornamented; on the right

stands a male, bearing a pronged instrument, resembling a trident; on the left is a female, holding a mace or sceptre; near the principal is a beautiful youth on an elephant; above this is a figure with four heads, supported by swans or geese; and opposite is a male with four arms, mounted on the shoulders of another, having a sceptre in one of the hands. At the top of the niche small figures in different attitudes are observed, seemingly supported by clouds.

The most conspicuous of the group on the niche to the left, is a male near seventeen feet in height, with four arms; on the left stands a female about fifteen feet high. The same circular rings worn by the present *Hindu* women, are observed on the legs and wrists of this figure; the hair bears a like correspondence in the mode of putting it up; the countenance is peculiarly soft, and expressive of gentleness. In the back ground, a figure with four heads, supported by birds, and one with four arms on the shoulders of another, are also observed. Several smaller figures in attendance: one with the right knee bent to the ground, in the attitude of addressing the principal, bears a crese, exactly resembling that in present use. The heads of most of the small male figures have a whimsical appearance, being covered with an exact resemblance of our wigs.

On each side of these groups is a small dark room, sacred in ancient times perhaps to all but the unpolluted *Brâhmin;* but bats, spiders, scorpions, and snakes are now in the possession.

Left of the last described group, and nearer the side of the cave, is another; a male is observed in the action of leading a female towards a majestic figure seated in the corner of the niche, his head covered like our judges on the bench; the countenance and

attitude of the female highly expressive of modesty, and a timid reluctance: a male behind urges her forward. Several smaller figures compose this group.

Curious it is to observe all the female figures having ornaments round the wrists and legs like those worn by the *Hindu* women at present, while the males bearing the same correspondence, have ornaments round the wrists only.

Opposite the last niche, and fifty feet nearer the entrance, is another of equal dimensions, inclosing a figure that forcibly arrests the attention: it is a gigantic half-length of a male with eight arms; round one of the left arms a belt, composed of human heads, is seen; a right hand grasps a sword uplifted to sever a figure, seemingly kneeling (but too much mutilated to distinguish it properly) on a block, held in the correspondent left hand; a *Cobra de Capella* rises under one arm; among the singular decorations of the head, a human skull is observed: above are several small figures, represented in distress and pain. Many of the figures mutilated, as is the principal, whose aspect possesses a great degree of unrelenting fierceness.

Crossing to the other side of the cave, near one of the small rooms, before mentioned, a male sitting as the people of this country do at present, is observed; a female in the same posture on his left, with an attendant on either side: at the feet of the male is the figure of a bull couchant; and in each corner of the niche stands a gigantic guard. Opposite is a correspondent niche: the figures being a good deal mutilated, and the situation dark, prevent these being properly discriminated; a sitting male figure, having an attendant on either hand, is however most easily perceived.

A niche filled with figures, greatly defaced, is observed on each side the entrance. On one side is a male that had eight arms, which are all destroyed: in the back part is the figure with four arms, supported by birds; and the other figure with four heads, whimsically elevated. A large sitting figure is the principal in the opposite niche; a horse and rider in the back ground; the former caparisoned according to the present mode in this country.

On the left side and half way up the cave, is an apartment about thirty feet square, enclosing the *Lingam;* an entrance on the four sides; and each side of either entrance is supported by a figure seventeen feet in height, each figure ornamented differently.

The part of this surprising monument of human skill and perseverance hitherto described is generally called *the Great Cave;* its length is 135 feet, and breadth nearly the same. A plan accompanies this account, which, however, I cannot venture to pronounce perfectly correct, having mislaid a memorandum of *particular* parts which were deduced, and with sufficient correctness perhaps from the *general* measures preserved. But there are compartments on both sides, separated from the great cave, by large fragments of rock and loose earth, heretofore probably a part of the roof. That on the right is spacious, and contains several pieces of sculpture: the most remarkable is a large figure, the body human, but the head that of an elephant. The lingam is also enclosed here. Above each, of a line of figures standing in a dark situation, is a piece of sculpture, pointed out to me as an inscription: however (with the assistance of a torch) I found one an exact copy of the other, and with little resemblance of characters.

The compartment on the other side contains several sculptures, and among the rest, a figure with an

elephant's head and human body. A deep cavity in the rock hereabout contains excellent water, which, being sheltered from the influence of the sun, is always cool, and deservedly held in estimation by those whom curiosity leads here through a scorching atmosphere. A traditional account of the extent of this cavity, and the communication of its waters by subterraneous passages, with others, very distant, was given me by a native of the island; which would make a considerable figure in the hands of a poet.

Gigantic as the figures are, the mind is not disagreeably moved on viewing them: a certain indication of the harmony of the proportions. Having measured three or four, and examined the proportions by the scale we allow the most correct, I found many stood even this test, while the disagreements were not equal to what are met with every day in people whom we think by no means ill proportioned.

The island wherein these curious remains of antiquity are situated, is about five miles and a half from *Bombay*, in an easterly direction; its circumference cannot be more than five miles: a neat village near the landing-place contains all its inhabitants, whom, inclusive of women and children, number about one hundred. Their ancestors, they tell you, having been improperly treated by the *Portuguese*, fled from the opposite island of *Salsette* hither, cultivating rice, and rearing goats for their support. In the same humble road do they continue. The islanders have no boat; they cut wood from the adjoining hills, which the purchasers remove in boats of their own; they are under our protection, and pay about fifty-six pounds annually to the government; the surplus revenue furnishes their simple clothing. By persevering in this humble path, these harmless people continue to rejoice in tranquillity under their banyan-tree. The

cave, they tell you, was formed by the gods: and this is all they pretend to know of the matter.

Various have been, and are to this day, the conjectures respecting the *Elephanta Cave*. Those who attempt to deduce its origin from the *Egyptians*, from the *Jews*, or from *Alexander the Great*, appear to me, with due deference, to give themselves much unnecessary trouble; which I shall further endeavour to shew as briefly as the subject will admit of, though at the same time it must be observed, that resembling features are not wanting in the case of the *Egyptians* and of the *Jews*, to lead towards such deductions; but these resemblances strike me as tending to the elucidation of a more interesting hypothesis, *viz.* That the systems of those people were copies of an original, found in this part of the world.

The striking resemblance in several particulars of the figures in the cave to the present *Hindu* race, would induce those who from history, as well as from observation, have reason to believe they have preserved the same customs from time immemorial, to imagine the ancestors of these people its fabricators; but those who are in a small degree acquainted with their *mythology*, will be persuaded of it; nor is a much greater extent of knowledge requisite to enable us to discover it to be a temple dedicated principally to *Siva*, the *destroyer* or *changer*.

The *bust* is doubtless a personification of the three grand *Hindu* attributes of that *Being* for *whom* the ancient *Hindus* entertained the most profound veneration, and of *whom* they had the most sublime conceptions. The middle head represents *Brahma*, or the creative attribute; that on the left, *Vishnu*, or the preserving; and the head on the right, *Siva*, or the destructive or changing attribute.

The figure with *one breast* has been thought by most to represent an *Amazon;* it however appears to me a representation of the *consort of Siva*, exhibiting the active power of her lord; not only as *Bawani*, or courage, but as *Isani*, or the goddess of Nature, considered as male and female, and presiding over generation, and also as *Durga*. Here we find the bull of *Iswara* (one of *Siva's* names) and the figure bearing his trisule, or trident. The beautiful figure on the elephant is, I imagine, *Cama*, or the *Hindu* god of Love; the figure with *four heads*, supported by *birds*, is a representation of *Brahma;* and that with *four arms*, mounted on the shoulders of another, is *Vishnu*.

The two principal figures in the niche to the left, represent, perhaps, *Siva* and his goddess as *Parvati*. Here, as before, we observe *Brahma* and *Vishnu* in the *back ground*.

The terrific figure with eight arms, has been much talked of; some will have it to represent *Solomon*, threatening to divide the harlot's child; others, with more reason on their side, suppose it to represent the tyrant *Cansa*, attempting the life of the infant god *Crishna*, when fostered by the herdsman *Ananda*. To me, the third attribute, or the *destroyer in action*, appears too well represented to be mistaken. The distant scene, where the smaller figures appear in distress and pain, is perhaps the infernal regions. The figure about to be destroyed, does not seem to me an infant, but a full grown person; if, indeed, the destroyer was of the human size, the figure in question would bear the proper proportion as an infant; but as he is of enormous magnitude, a human *being*, full grown, would appear but an infant by the side of him; and thus it is, I imagine, that people have been deceived: a case by no means uncommon in circumstances like the present.

The sitting male and female figures, having a bull couching at the feet of the former, are *Siva* and his goddess; and thus are they represented in the pagodas of the present day.

No person can mistake the figure with the human body and elephant's head for any other than *Ganésa*, the *Hindu* god of Wisdom, and the first-born of *Siva*; and thus is he represented at present.

From what has been advanced, it will appear incontestible, I imagine, that this is a *Hindu temple;* whence the *Lingam* is a testimony sufficient of *Siva's* having presided here, without the other evidences which the intelligent in the *Hindu* mythology will have discovered in the course of this account.

To deduce the æra of the fabrication of this structure is not so easy a task; but it was, no doubt, posterior to the great schism in the *Hindu* religion, which, according to the *Puranas*, I learn, happened at a period coeval with our date of the creation. Be this as it may, we have accounts of powerful princes who ruled this part of the country of a later date, particularly of one who usurped the government in the ninetieth year of the *Christian* æra, famed for a passion for architecture. Many worse hypotheses have been, than one which might be formed of his having founded the cave; but I am led to imagine, no certain conclusions on this dark subject could be drawn from the sources of information open at present.

XXXII.

AN ACCOUNT OF THE PRESENT STATE OF DELHI.

BY LIEUTENANT W. FRANKLIN.

THE once celebrated city of *Delhi*, the capital of *Mussulman* sovereignty in *Hindostan*, and, in more early times, the seat of *Hindu* dominion over northern *India*, has employed the pen of many different authors, *Asiatic* and *European*; though of the latter in a less degree than might have been expected.

The following account of the present state of this ancient city, is extracted from a journal of observations made during an official tour through the *Dovab* and the adjacent districts, in company with Captain *Reynolds*, of the *Bombay* establishment, appointed by the *Bengal* government to survey that part of the country in the year 1793.

It cannot be supposed to contain much new information on things already described by others; but, as a faithful statement of the actual condition of the once flourishing metropolis of a great kingdom now in ruins, it may be acceptable; and in this hope it is offered, with deference to the Society; who will judge whether it be deserving of more general dif-

fusion by publication with their more important researches.

The extent of the ruins of old *Delhi* cannot, I suppose, be less than a circumference of twenty miles, reckoning from the gardens of *Shalimar*, on the north-west, to the *Cuttub Minar* on the south-east; and proceeding from thence along to the heart of the old city by way of the mausoleum of *Nizam-u-deen*, on which stands *Humaioon's* tomb, and the old fort of *Delhi* on the banks of the *Jumna*, to the *Ajmere*-gate of *Shah Jehanabad*.

The environs to the north-west are crowded with the remains of spacious gardens and country-houses of the nobility, which were formerly abundantly supplied with water by means of the noble canal dug by *Ali Mirdan Khan*, and which formerly extended from above *Paniput* quite down to *Delhi*, where it joined the *Jumna*; fertilizing in its course a track of more than ninety miles in length, and bestowing comfort and affluence on those who lived within its extent. This canal, as it ran through the suburbs of *Mogul Parah*, nearly three miles in length, was about twenty-five feet deep, and about as much in breadth, cut from the solid stone-quarry, on each side, from which most of the houses in the neighbourhood have been built. It had small bridges erected over it at different places, some of which communicated with the garden-houses of the nobility.

In the year of the *Hagiree* 1041 (A. C. 1631-2) the Emperor *Shah-Jehan* founded the present city and palace of *Shah-Jehanabad*, which he made his capital during the remainder of his reign. The new city of *Shah-Jehanabad* lies on the western bank of the *Jumna*, in latitude 28° 36′ north. The city is about seven miles in circumference, and is surrounded on

three sides by a wall of brick and stone: a parapet runs along the whole, with loop-holes for musquetry; but there are no cannon planted on the ramparts. The city has seven gates; viz. *Lahore*-gate, *Ajmere*-gate, *Turkoman*-gate, *Delhi*-gate, *Moor*-gate, *Cabul*-gate, and *Cashmere*-gate; all of which are built of free-stone, and have handsome arched entrances of stone, where the guards of the city keep watch. Near the *Ajmere*-gate is a *Madrissa*, or college, erected by *Ghazi-u-deen Khan*, nephew of *Nizam-ul-Moolluck*: it is built of red stone, and situated at the centre of a spacious quadrangle, with a stone fountain. At the upper end of the area is a handsome mosque built of red stone, inlaid with white marble. The apartments for the students are on the sides of the square, divided into separate chambers, which are small but commodious. The tomb of *Ghazi* is in the corner of the square, surrounded by a shrine of white marble, pierced with lattice-work. The college is now shut up, and without inhabitants. In the neighbourhood of the *Cabul*-gate is a garden, called *Tees Huzzari Baug*, in which is the tomb of the queen *Malka Zemani*, wife of the emperor *Mohummud Shah*: a marble tablet, placed at the head of the grave, is engraved with some *Persian* couplets, informing us of the date of her death, which happened five years since, *ann. Hagiree* 1203. Near this tomb is another, of the princess *Zeebul Nissah Begum*, daughter of *Aurungzebe*. On a rising ground near this garden, from whence there is a fine prospect of *Shah Jehanabad*, are two broken columns of brown granate, eight feet high, and two and a half in breadth, on which are inscriptions in an ancient character.

Within the city of new *Delhi* are the remains of many splendid palaces, belonging to the great Omrahs of the empire. Among the largest are those of *Kummer-u-deen Khan, Vizier* to *Mohummud Shah*;

Ali Mirdan Khan, the *Persian*; the *Nabob Ghazi-u-deen Khan*; *Sefdur Jung*; the garden of *Coodseah Begum*, mother to *Mohummud Shah*; the palace of *Sadut Khan*; and that of *Sultan Darah Shekoah*. All these palaces are surrounded with high walls, and take up a considerable space of ground. Their entrances are through lofty arched gateways of brick and stone, at the top of which are the galleries for music: before each is a spacious court-yard for the elephants, horses, and attendants of the visitors. Each palace has likewise a *mahal*, or seraglio, adjoining; which is separated from the *Dewan Khana* by a partition-wall, and communicates by means of private passages. All of them had gardens with capacious stone-reservoirs and fountains in the centre; an ample terrace extended round the whole of each particular palace; and within the walls were houses and apartments for servants and followers of every description, besides stabling for horses, *Feel Khanas*, and every thing belonging to a nobleman's suite. Each palace was likewise provided with a handsome set of baths, and a *Teh Khana* under ground. The baths of *Sadut Khan* are a set of beautiful rooms, paved and lined with white marble: they consist of five distinct apartments, into which light is admitted by glazed windows from the top of the domes. *Sufder Jung's Teh Khana* consists of a set of apartments, built in a light delicate manner; one long room, in which is a marble reservoir, the whole length; and a small room, raised and ballustraded on each side, both faced throughout with white marble.

Shah Jehanabad is also adorned with many fine mosques, several of which are still in perfect beauty and repair. The following are most worthy of being described: the first, the *Jama Musjed*, or great cathedral. This mosque is situated about a quarter of a mile from the royal palace; the foundation of it was

laid upon a rocky eminence, named *Jujula Pahar*, and has been scarped on purpose. The ascent to it is by a flight of stone steps, thirty-five in number, through a handsome gateway of red stone. The doors of this gateway are covered throughout with plates of wrought brass, which Mr. *Bernier* imagined to be copper. The terrace on which the mosque is situated, is a square of about fourteen hundred yards of red stone; in the centre is a fountain lined with marble, for the purpose of performing the necessary ablutions previous to prayer. An arched colonnade of red stone surrounds the whole of the terrace, which is adorned with octagon pavilions at convenient distances, for sitting in. The mosque is of an oblong form, two hundred and sixty-one feet in length, surrounded at top by three magnificent domes of white marble, intersected with black stripes, and flanked by two *minarets* of black marble and red stone alternately, rising to the height of a hundred and thirty feet. Each of these *minarets* has three projecting galleries of white marble; and their summits are crowned with light octagon pavilions of the same. The whole front of the *Jama Musjed* is faced with large slabs of beautiful white marble; and along the cornice are ten compartments, four feet long, and two and a half broad, which are inlaid with inscriptions in black marble, in the *Nuski* character, and are said to contain great part, if not the whole, of the *Koran*. The inside of the mosque is paved throughout with large flags of white marble, decorated with a black border; and is wonderfully beautiful and delicate: the flags are about three feet in length by one and a half broad. The walls and roof are lined with plain white marble; and near the *Kibla* is a handsome *taak*, or niche, adorned with a profusion of frieze-work. Close to this is a *mimber*, or pulpit, of marble, having an ascent of four steps, and ballustraded. The ascent to the *minarets* is by a winding stair-case of a hundred and

thirty steps of red stone; and at the top you have a noble view of the king's palace, and the whole of the *Cuttub Minar*, the *Kurran Minar*, *Humaioon's* tomb, the palace of *Ferose Shah*, the fort of old *Delhi*, and the fort of *Loni*, on the opposite side of the *Jamna*. The domes are crowned with cullises, richly gilt, and present a glittering appearance from a distance. This mosque was begun by *Shah Jehan*, in the fourth year of his reign, and completed in the tenth; the expenses of its erection amounted to ten lacks of rupees; and it is in every respect worthy of being the grand cathedral of the empire of *Hindostan*.

Not far from the palace is the mosque of *Roshun-a-Dowlah*, rendered memorable to the *Delhians* for being the place where *Nadir Shah* saw the massacre of the unfortunate inhabitants. The cause assigned by historians for this inhuman act is, that a sedition broke out in the great market, in which two thousand *Persians* were slain. *Nadir*, on hearing of the tumult, marched out of the fort at night with a small force to the *Musjed* of *Roshun-a-Dowlah:* where he was fired upon in the morning from a neighbouring terrace, and an officer killed close by his side. He instantly ordered an indiscriminate slaughter of the inhabitants; and his squadrons of cavalry pouring through the streets, before the afternoon put to death a hundred thousand persons of all descriptions. "The King of *Persia*," says the translator of *Ferishta*, "sat, during the dread-
"ful scene, in the *Musjed* of *Roshun-a-Dowlah*.
"None but slaves durst come near him, for his coun-
"tenance was dark and terrible. At length the un-
"fortunate Emperor, attended by a number of his
"chief Omrahs, ventured to approach him with
"downcast eyes. The Omrahs who preceded *Mo-*
"*hummud*, bowed down their foreheads to the
"ground. *Nadir Shah* sternly asked them what they

wanted? they cried out with one voice, Spare the "city. *Mohummud* said not a word, but tears flowed "fast from his eyes; the tyrant, for once touched "with pity, sheathed his sword, and said, For the "sake of the prince *Mohummud*, I forgive." Since this dreadful massacre this quarter of *Delhi* has been but very thinly inhabited. The mosque of *Roshun-a-Dowlah* is situated at the entrance of the *Chandney Choke*, or market; it is built of red stone, of the common size, and surmounted by three domes richly gilt.

Zeenul-al Mussajid, or the ornament of mosques, is on the banks of the *Jumna*, and was erected by a daughter of *Aurungzebe*, of the name of *Zeenut al Nissáh*. It of red stone, with inlayings of marble; and has a spacious terrace in front of it, with a capacious reservoir faced with marble. The princess who built it, having declined entering into the marriage state, laid out a large sum of money in the above mosque, and on completing it, she built a small sepulchre of white marble, surrounded by a wall of the same, in the west corner of the terrace. In this tomb she was buried in the year of the *Hagiree* 1122, corresponding with the year of *Christ* 1710. There were formerly lands allotted for the support and repairs of this place, amounting to a lack of rupees *per annum;* but they all have been confiscated during the troubles this city has undergone. Exclusive of the mosque above described, there are in *Shah Jehanabad* and its environs above forty others; but as most of them are of inferior size, and all of them of the same fashion, it is unnecessary to present any further detail.

The modern city of *Shah Jehanabad* is rebuilt, and contains many good houses, chiefly of brick. The streets are in general narrow, as is usual in most of the large cities in *Asia;* but there were formerly two

very noble streets; the first leading from the palace-gate through the city to the *Delhi*-gate, in a direction north and south. This street was broad and spacious, having handsome houses on each side of the way, and merchants shops well furnished with the richest articles of all kinds. *Shah Jehan* caused an aqueduct to be made of red stone, which conveyed the water along the whole length of the street, and from thence into the royal gardens, by means of a reservoir under ground. Some remains of the aqueduct are still to be seen; but it is choked up in most parts with rubbish. The second grand street was likewise from the palace to the *Lahor*-gate, lying east and west: it was equal in many respects to the former; but in both of them the inhabitants have spoiled their appearance, by running a line of houses down the centre, and across the streets in other places, so that it is with difficulty a person can discover their former situation without a narrow inspection. The bazars in *Delhi* are but indifferently furnished at present, and the population of the city miserably reduced of late years: the *Chandney Choke* is the best furnished bazar in the city, though the commerce is very trifling. Cotton cloths are still manufactured, and the inhabitants export indigo. Their chief imports are by means of the northern caravans which come once a year, and bring with them from *Cabul* and *Cashmere*, shawls, fruit, and horses: the two former articles are procurable in *Delhi* at a reasonable rate. There is also a manufacture at *Delhi* for beedree hooka bottoms. The cultivation about the city is principally on the banks of the *Jumna*, where it is very good; the neighbourhood produces corn and rice, millet and indigo. The limes are very large and fine. Precious stones likewise are to be had at *Delhi*, of very good quality, particularly the large red and black cornelians; and peerozas are sold in the several bazars.

The city is divided into thirty-six mohauls or quarters, each of which is named either after the particular Omrah who resided there, or from some local circumstance relative to the place. It appears that the modern city of *Shah Jehanabad* has been built principally upon two rocky eminences; the one where the *Jama Musjed* is situated, named *Jujula Pahar:* and the other, the quarter of the old-sellers, called *Bejula Pahar:* from both of these eminences you have a commanding view of the remainder of the city. Ancient *Delhi* is said by historians to have been directed by Rajah *Delhi,* who reigned in *Hindostan* prior to the invasion of *Alexander the Great;* others affirm it to have been built by Rajah *Pettourah,* who flourished in a much later period. It is called in *Sanscrit, Indraput,* or the abode of *Indra,* one of the *Hindu* deities; and it is also thus distinguished in the royal diplomas of the chancery-office. Whether the city be of the antiquity reported, it is difficult to determine: but this much is certain, that the vast quantity of buildings which are to be found in the environs for upwards of twenty miles in extent, as well as their grandeur and style of architecture, prove it to have once been a rich, flourishing, and populous city.

On the 11th of *March* we were presented to the King *Shah Allum.* After entering the palace we were carried to the *Dewaun Khanah,* or hall of audience for the nobility, in the middle of which was a throne raised about a foot and a half from the ground. In the centre of this elevation was placed a chair of crimson velvet, bound with gold clasps, and over the whole was thrown an embroidered covering of gold and silver thread: a handsome *Samianah,* supported by four pillars incrusted with silver, was placed over the chair of state. The king at this time was in the *Tusbeah Khanah:* an apartment in which he generally sits. On passing a skreen of *Indian* connaughts, we

proceeded to the front of the *Tusbeah Khanah*, and being arrived in the presence of the King, each of us made three obeisances in turn, by throwing down the right hand pretty low, and afterwards raising it to the forehead; we then went up to the Musnud on which his Majesty was sitting, and presented our nuzzers on white handkerchiefs, each of our names being announced at the time we offered them: the King received the whole, and gave the nuzzers to *Mirza Akber Shah*, and two other princes who sat on his left hand. We then went back, with our faces towards the presence, made the same obeisance as before, and returned again to the Musnud. After a slight conversation, we were directed to go without the inclosure, and put on the *Khelauts* which his Majesty ordered for us; they consisted of light *India* dresses; a turban, jammah, and kummerbund, all cotton, with small gold sprigs. On being clothed in these dresses, we again returned to the *Tusbeah Khanah*, and after a few minutes stay, previous to which Capt. *Reynolds* received a sword from the King, we had our dismission; and some servants were ordered to attend us in viewing the palace.

The present King, *Shah Allum*, is seventy-two years of age; of a tall commanding stature, and dark complexion; his deportment was dignified, and not at all diminished by his want of sight, though he has suffered that cruel misfortune above five years. The marks of age are very strongly discernible in his countenance: his beard is short and white. His Majesty appeared at our introduction to be in good spirits; said he was happy at our arrival; and desired we would visit his palace and the fort of *Selim Ghur*.—His Majesty's dress on this occasion was a rich kheem-khaub; and he was supported by pillows of the same materials.

I imagined I could observe in his aspect a thoughtfulness, as if sufficiently acquainted with his degradation, and the recollection of his former state.

The palace of the royal family of *Timur* was erected by the Emperor *Shah Jehan* at the time he finished the new city; it is situated on the western bank of the *Jumna*, and surrounded on three sides by a wall of red stone. I suppose the circumference of the whole to be about a mile. The two stone figures, mentioned by *Bernier*, at the entrance of the palace, which represented the Rajah of *Chitore* and his brother *Pottah*, seated on two elephants of stone, are not now to be seen; they were removed by order of *Aurungzebe*, as savouring too much of idolatry; and he enclosed the place where they stood with a skreen of red stone, which has disfigured the entrance of the palace. The first object that attracts the attention after entering the palace, is the *Dewaun Aum*, or public hall of audience, for all descriptions of people. It is situated at the upper end of a spacious square, and is a noble building, but at present much in decay. On each side of the *Dewaun Aum*, and all round this square, are apartments of two stories high, the walls and front of which, in the times of the splendor of the empire, were adorned with a profusion of the richest tapestry, velvets, and silks; the nobles vying with each other in rendering them the most magnificent, especially on festivals, and days of public rejoicings, when they presented a grand sight. These decorations have however been long since laid aside, and nothing but the bare walls remained. From the *Dewaun Aum* we proceeded through another handsome gateway to the *Dewaun Khass*, before mentioned. The building is situated at the upper end of a spacious square, and elevated upon a marble terrace, about four feet high. The *Dewaun Khass* in former times has been adorned with excessive magnificence, and though stripped and

plundered by various invaders, still retains sufficient beauty to render it admired. I judge the building to be a hundred and fifty feet in length, by forty in breadth. The roof is flat, supported by a great many columns of fine white marble, which have been richly adorned with inlaid flower-work of beautiful stones: the cornices and borders have been decorated with a great quantity of frieze and sculptured work. The ceiling was formerly incrusted with a work of rich foliage of silver throughout the whole extent, which has been long since taken off and carried away. The delicacy of the inlaying in the compartments of the walls is much to be admired; and it is a matter of heartfelt regret to see the barbarous ravages that have been made in picking out the different cornelians, and breaking the marble by violence. Around the interior of the *Dewaun Khass*, in the cornice, are the following lines, engraved in letters of gold upon a white marble ground:—

" If there be a paradise upon earth, this is it—'tis this, 'tis this." The terrace on which the *Dewaun Khanah* is built is composed of large beautiful slabs of white marble; and the building is crowned at top with four pavilions or cupalos, of the same materials.

The royal baths, built by *Shah Jehan*, are situated a little to the northward of the *Dewaun Khass*, and consist of three very large apartments surmounted by white marble domes. The inside of the baths is lined, about two-thirds of the way up, with marble, having a beautiful border of flower-worked cornelians and other precious stones, executed with taste. The floors are paved throughout with marble in large slabs, and there is a fountain in the centre of each, with many pipes: large reservoirs of marble, about four feet deep, are placed in different parts of the walls; the light is admitted from the roof by win-

dows of party-coloured glasses; and capacious stones, with iron gratings, are placed underneath each separate apartment. There is a noble mosque adjoining, entirely of white marble, and made after the fashion described above. In the *Shah Baug*, or the royal gardens, is a very large octagon-room, which looks towards the river *Jumna*. This room is called *Shah Boorj*, or the royal tower; it is lined with marble; and from the window of it the late heir apparent, *Mirza Juwan Bukht*, made his escape in the year 1784, when he fled to *Lucknow:* he descended by means of a ladder made with turbans; and as the height is inconsiderable, effected it with ease. A great part of this noble palace has suffered very much by the destructive ravages of the late invaders. The *Rohillas* in particular, who were introduced by *Gholaum Kauder*, have stripped many of the rooms of their marble ornaments and pavements, and have even picked out the stones from the borders of many of the floorings. Adjoining is the fortress of *Selim Ghur*, which you reach by a stone-bridge, built over an arm of the *Jumna*. The fort is now entirely in ruins. At the eastern end of it were shewn the sally-port, from which *Gholaum Kauder Khan* made his escape with all his retinue, when the place was besieged by the *Mahrattas* in 1788. The river *Jumna* running directly underneath this bastion, the tyrant crossed it immediately, and fled to *Meerut*, in the *Doob*.

The *Gehtur Munter*, or observatory, in the vicinity of *Delhi*, has been described by former travellers. It was built in the third year of the reign of *Mohummud Shah*, by the Rajah *Jeysing*, who was assisted by many persons celebrated for their science in astronomy from *Persia*, *India*, and *Europe;* but died before the work was completed; and it has since been plundered, and almost destroyed by the *Jeits*, under *Juwaher Sing*.

I will only add a short account of the royal gardens of *Shalimar*. These gardens, made by the Emperor *Shah Jehan*, were begun in the fourth year of his reign, and finished in the thirteenth; on which occasion, according to Colonel *Dow*, the Emperor gave a grand festival to his court. These gardens were laid out with admirable taste, and cost the enormous sum of a million sterling: at present their appearance does not give cause to suppose such an immense sum has been laid out upon them; but great part of the most valuable and costly materials have been carried away. The entrance to them is through a gate-way of brick; and a canal, lined with stone, having walks on each side with a brick pavement, leads up to the *Dewaun Khanah*, or hall of audience; most part of which is now fallen down: from thence, by a noble canal, having a fountain in the centre, you proceed to the apartments of the *Haram*, which embrace a large extent of ground. In the front is an *Ivan*, or open hall, with adjoining apartments; the interior of which are decorated with a beautiful border of white and gold painting, upon a ground of the finest chunam. At the upper end of this *Ivan* was formerly a marble throne, raised about three feet from the ground; all of which is removed. On each side of this *Ivan*, inclosed by high walls, are the apartments of the *Haram*, some of which are built of red stone, and some of the brick faced with fine chunam, and decorated with paintings of flowers of various patterns. All these apartments have winding passages which communicate with each other, and the gardens adjoining by private doors. The extent of *Shalimar* does not appear to have been large: I suppose the gardens altogether are not above a mile in circumference. A high brick wall runs around the whole, which is destroyed in many parts of it, and the extremities are flanked with octagon pavilions of red stone. The gardens still abound with trees of a very large size, and very old. The prospect

to the southward of *Shalimar* towards *Delhi*, as far as the eye can reach, is covered with the remains of extensive gardens, pavilions, mosques, and burying-places, all desolate and in ruins. The environs of this once magnificent and celebrated city appear now nothing more than a shapeless piece of ruins; and the country round about is equally forlorn.

Fig. 3.
Fig. 4.
The Spikenard of the Ancients
Fig. 2.
Fig. 1.
Prosopis spicata. Konig.
Tshamie of the Hindus in the Northern Circars.

XXXIII.

BOTANICAL OBSERVATIONS

ON

THE SPIKENARD OF THE ANCIENTS:

INTENDED AS A SUPPLEMENT TO THE LATE

SIR WILLIAM JONES'S PAPERS ON THAT PLANT.

BY WILLIAM ROXBURGH, M. D.

VALERIANA JATAMANSI.

GENERIC CHARACTER.

FLOWERS triandrous, leaves entire, four-fold, the inner radical pair petioled, and cordate; the rest smaller, sessile, and sub-lanceolate; seeds crowned with a pappus.

V. *Jatamansi* of Sir *William Jones.* See *Asiatic Researches*, vol. ii. page 405 and 417, and page 105 of this volume.

November 6th, 1794. I received from the Honourable *C. A. Bruce*, commissioner at *Coos-Beyhar*, two small baskets with plants of this valuable drug. He writes to me on the 27th *September* (so long had the plants been on the road) that he had, the day before, received them from the *Deb Rajah* of *Bootan;*

and further says, that the *Booteahs* know the plant by two names, *viz. Jatamansi* and *Pampé*, or *Paumpé*.

I need scarce attempt to give any further history of this famous odoriferous plant than what is merely botanical: and that with a view to help to illustrate the learned dissertations thereon, by the late Sir *William Jones*, in the 2d and 4th volumes of these Researches; and chiefly by pointing out the *part of the plant* known by the name *Indian Nard*, or *Spikenard*; a question on which *Mathiolus*, the commentator of *Dioscorides*, bestows a great deal of argument; *viz.* Whether the roots or stalks were the parts esteemed for use? the testimony of the ancients themselves on this head, being ambiguous. It is therefore necessary for those who wish for a more particular account of it, to be acquainted with what that gentleman has published on the subject.

The plants now received, are growing in two small baskets of earth; in each basket there appears above the earth between thirty and forty hairy spike-like bodies, but more justly compared to the tails of *Ermines*, or small *Weasels**; from the apex of each, or at least of the greatest part of them, there is a smooth lanceolate or lanceolate-oblong, three or five-nerved, short-petioled, acute or obtuse, slightly serrulate leaf or two shooting forth. Fig. 1, represents one of them in the above state; and on gently removing the fibres or hairs which surround the short petiols of these leaves, I find it consists of numerous sheaths, of which one, two, or three of the upper or interior ones are entire, and have their fibres connected by a glu-

* The term spica, or spike, is not so ill applied to this substance as may be imagined; several of the Indian grasses, well known to me, have spikes almost exactly resembling a single straight piece of nardus: and when those hairs (or flexible arista, like bristles) are removed, *Pliny's* words, "frutex radice pingui et crassa," are by no means inapplicable. See fig. 2, from *a* to *b*.

brown coloured membranous substance, as at *b*; but in the lower exterior sheaths, where this connecting membrane is decayed, the more durable hair-like fibres remain distinct, giving to the whole the appearance of an *Ermine's* tail: this part, as well as the root, are evidently perennial*. The root itself (beginning at the surface of the earth where the fibrous envelope ends) is from three to twelve inches long, covered with a pretty thick light-brown coloured bark: from the main root, which is sometimes divided, there issues several smaller fibres. Fig. 2, is another plant with a long root; here the hair-like sheaths, beginning at *a*, are separated from this, the perennial part of the stem, and turned to the right side; at the apex is seen the young shoot, marked 6, which is not so far advanced as at fig. 1; *ccc* show the remains of last year's annual stem. When the young shoot is a little further advanced than in fig. 2, and not so far as in fig. 1, they resemble the young convolute shoots of monoco-tyledonous plants, *June* 1795.—The whole of the above-mentioned plants have pe-

* The above described perennial hairy portion of the plant, is clearly the *Indian* spikenard of our shops; but whether the nardus of the ancients or not, I leave to better judges to determine; however, I believe few will doubt it after having read Sir *William Jones's* Dissertations thereon, and compared what he says with the accompanying drawings of the perennial hairy part of the stem of this plant, which are taken from the living plants immediately under my own eyes: the drawing of the herbaceous, or upper part of the plant, is out of the question in determining this point, and only refers to the place the plant bears in our botanical books. While writing the above, I desired an *Hindu* servant to go and buy me from their apothecaries' shops a little *Jatamansi*. Without saying more or less, he immediately went and brought me several pieces of the very identical drug I have been describing: a drawing of one of the pieces is represented at fig. 4, and agrees not only with those I have taken from the living plants, but also exceeding well with *Garcias ab Orta's* figure of the nardus indica, which is to be found at page 129, of the fourth edition of *Clusius's Latin* translations of his *History of Indian Drugs*, published in 1693.

rished without producing flowers, notwithstanding every care that could possibly be taken of them.—The principal figure in the drawing, marked fig. 3, and the following description, as well as the above definition, are therefore chiefly extracted from the engraving and description in the second volume of these Researches, and from the information communicated to me by Mr. *Burt*, the gentleman who had charge of the plants that flowered at *Gaya*, and who gave Sir *William Jones* the drawing and description thereof.

Description of the Plant.

Root, it is already described above.

Stem, lower part perennial, involved in fibrous sheaths, &c. as above described; the upper part herbaceous, suberect, simple, from six to twelve inches long.

Leaves four-fold, the lowermost pair of the four radical are opposite, sessile, oblong, forming, as it were, a two-valved spathe; the other pair are also opposite petioled, cordate, margins waved and pointed; those of the stem sessile and lanceolate; all are smooth on both sides.

Corymb terminal, first division trichotomous.

Bracts awled.

Calyx scarce any.

Corol one-petaled, funnel-shaped, tube somewhat gibbous. Border five-cleft.

Stamens, filaments three, project above the tube of the corol: anthers incumbent.

Pistil, germ beneath. Style erect, length of the tube. Stigma simple.

Pericarp, a single seed crowned with a pappus.

END OF THE FOURTH VOLUME.

W. Wilson, Printer, St. John's Square.

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